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Railway Age Gazette

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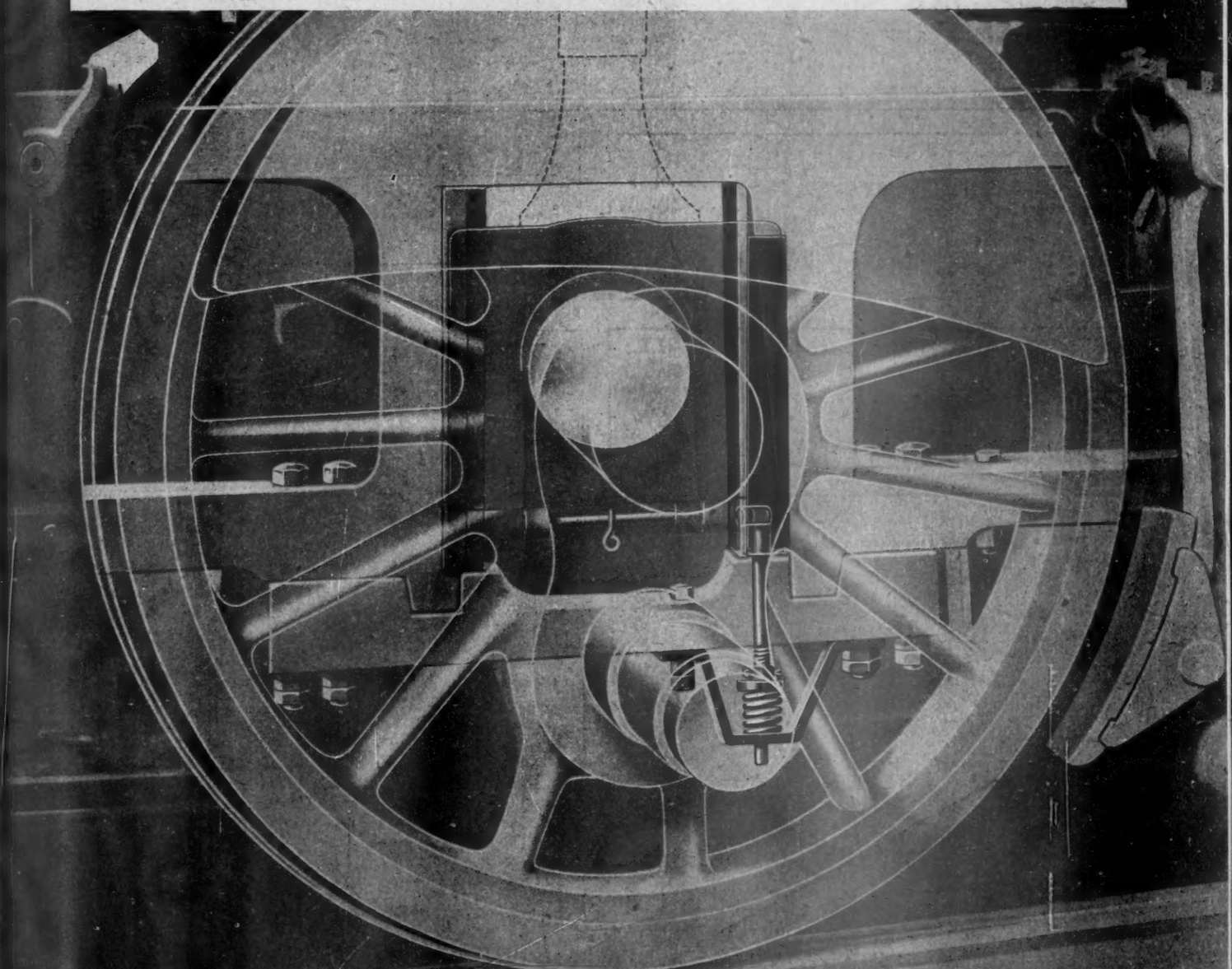

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Railway Age Gazette

Volume 62 May 25, 1917 No. 21

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One of the relatively minor, but by no means small, sources of waste in railway operation is the dining car service. Most railways claim to lose money on this service, and doubtless they do. With food prices so high as they are now, it will be impossible to avoid increasing the loss unless there is either a radical increase in the prices of the food served, or the adoption of some other equally drastic alternative. The *Railway Age Gazette* believes that the increase in costs should be offset rather by reductions of the sizes of the portions of food served to guests than by increases in the prices. The fact is, that on practically all dining cars as well as in a majority of hotels, most of the portions served are much too large for the average person. In consequence, a considerable part of the food is left uneaten and is thrown out. This is economic waste of the most flagrant kind, and under existing conditions the railways ought to refuse to continue to countenance it. Why continue, for example, as is done on most dining cars, to serve salads two or three times as large as the average person will eat, and then make the guest pay for what is thrown out as well as what he eats? The railways, through their dining car service, should lead in a reform of the almost criminal a la carte system so generally in vogue in this country, by which food prices are made excessive and a vast quantity of food is wasted. On the European railways the table d'hote system was almost universal before the war; and most Americans who have traveled in Europe, whether in England or on the continent, will testify that they not only paid less for what they got in the dining cars over there than here, but that they liked it better than what they get in the United States. There is no part of our railway service which needs drastic reformation more than our dining car service.

Waste in Railway Dining Car Service

On the day that the announcement of our contest on Car Interchange was on the press the Committee on Car Service issued an order setting aside a number of the rules which previously had been in effect governing the movement of freight cars and establishing new ones. Rather than making the contest obsolete, this drastic revision of the rules made it all the more timely, for it showed the inadequacy of the old rules and of their enforcement during a period of acute congestion and car shortage and the necessity for a careful study of this problem. The present rules are emergency regulations intended to apply only during the period of the war, and it is realized that a new code must be prepared to govern the interchange and movement of cars after conditions return to normal. The best time to consider such rules is when the experiences which caused the previous ones to break down are fresh in mind. Therefore, we call this contest to the attention of railway men interested in this problem and solicit their co-operation by the presentation of discussions of this subject which will aid in the preparation of the rules ultimately adopted. As a stimulus to the development of such a set of rules a railway man interested in this subject authorizes us to offer a prize of $50 for the best concrete plan of car interchange between railroads, calculated to give working effect to the principle laid down by the American Railway Association that each road is entitled to the possession of cars equal to its ownership. The *Railway Age Gazette* is glad to offer a second prize of $35 for the next best paper submitted on this subject, and will also pay its regular space rates for all other papers which are accepted by it for publication and printed. All papers to be entered in the contest on car interchange should be mailed to the editor of the *Railway Age Gazette*, 608 South Dearborn street, Chicago, before June 10.

The Contest on Car Interchange

"Your first patriotic duty—buy a Liberty Bond," reads the government's slogan. Your next patriotic duty, we beg leave to add, is to assist your employees to buy a Liberty Bond. A number of railway officers have emphasized the fact that men engaged in the actual operation and maintenance of railway lines will ill be spared from their present positions to join the fighting forces. The operation of the railways they say is just as essential for the success of our arms overseas as the proper conduct of the armies that will soon fight beneath the flag of France. Railway men, however, are not going to be content in the consciousness that while they may not be officers and soldiers, they are still doing a big part in helping their country in this crisis. They will wish to do more and can do more. And one of the things that with proper assistance they will want and will be able to do is to subscribe to Uncle Sam's Liberty Loan. But railway employees, as a rule, are not capitalists. For them to subscribe with-

Buy a Liberty Bond

out assistance will not be easy. All honor then to the Union Pacific, the Erie and other roads that have announced that they will help their employees buy Liberty Bonds on the installment plan. The Union Pacific, according to Chairman R. S. Lovett's announcement made last week, will make subscription for the account of any employee on request for bonds to an amount not exceeding 25 per cent of the employee's yearly salary, payments to be made thereon in monthly installments of 10 per cent of the monthly salary. These payments will be deducted from the wage payments and the bonds will be held by the company until they are paid for, interest being charged at the rate of 3½ per cent or at the same rate as the yield on the bonds. Other roads will no doubt follow suit, for they can do a tremendous patriotic service in this matter. There are about one and one-half million men employed in the transportation business, and they earn about one and one-half billion dollars yearly, or four million dollars daily. That the employees will be willing and ready to subscribe if they are properly encouraged goes without question. Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, in effect pledges them to that when he says "Railroad workers, and especially the men in the train service, are keen to do their bit for the common cause. If the railroad companies will provide the machinery of payment I know that our men will provide the money."

LOCOMOTIVE FEED WATER HEATING

HOW often is it realized that over 80 lb. out of every 100 lb. of coal fired on a locomotive, while the engine is working steam, is wasted through the exhaust steam and hot gases passing out through the stack; further, that of this 100 lb., only between six and seven pounds are actually utilized for pulling the train. When the locomotive is viewed in this light, it seems to be a very inefficient machine. As a matter of fact, it is, but still the conditions are such that practically and comparatively speaking, it is as efficient as many reciprocating stationary engines.

There are opportunities, however, for increasing the efficiency of this power unit and the Committee on Locomotive Feed Water Heating of the Railway Fuel Association has shown in its report how some of this 80 lb. wasted through the stack can be reclaimed by preheating the feed water. The report is abstracted elsewhere in this issue. It is very complete and one of the best reports ever presented on the advantages to be obtained from locomotive feed water heating. The committee has shown how the feed water may be heated by both the exhaust steam and waste gas methods. For maximum economy, the feed water must be brought from the temperature of the water in the tank to the temperature of the water in the boiler by using the smallest amount of steam directly from the boiler as possible. A large amount of live steam is required where the injector is used, and the water is heated to about 160 deg. by the steam with no economy in heat. Therefore in this case the saving to be made by preheating with the wasted heat must lie between the heat contained in the water at 160 deg. and the heat in the water when it is raised to the highest temperature the feed water heater is susceptible of furnishing. Where a steam driven pump is used, the wasted heat can start its preheating at the temperature of the water in the tank. This will be found to be the more economical thing to do, as locomotive feed water pumps are provided that will pump five and six times as much water per pound of steam as the injector.

From a theoretical standpoint, the maximum amount of preheat that it is possible to add to the feed water by the exhaust steam method is limited to the temperature of the exhaust steam, which is about 140 deg. less than that of the temperature of the saturated steam in the boiler. On the other hand, the temperature of the gases passing out through the stack being from 600 to 700 deg., is over 200 deg. higher than the temperature of the steam in the boiler. However, there is about three times as much heat available in the exhaust steam as in the waste gases and further, the heat is abstracted from the exhaust steam far easier than it is from the waste gases and a much smaller amount of heating surface is required to give the same amount of preheat. At the present time both methods are more or less in the experimental stage. The exhaust steam method is being rapidly developed and developments are planned for the waste gas method. There is one thing assured, and that is, that feed water heating is practical, and that it is the next important refinement to be added to the locomotive. If a combination exhaust steam and waste gas heater is found practical there is hardly a question but that savings of 20 to 25 per cent or more may be made. Tests so far have shown that savings over 10 per cent may be expected by the exhaust heater alone.

RAILWAYS REDUCE ACCIDENTS IN SPITE OF HEAVIER TRAFFIC

CONSIDERING the abnormal activity of freight traffic during the period beginning at about the commencement of the fiscal year 1916, the railway accident record during that period is remarkable. The increase in freight traffic in 1916 over the average for the preceding five years was 22.7 per cent, and though ton-mileage figures for the first three months of the fiscal year 1917 are not available, it is a matter of common knowledge that freight traffic in those months exceeded that in any of the months of the fiscal year preceding. Yet the accident bulletin recently issued by the Interstate Commerce Commission for the quarter including July, August and September, 1916, shows that there were only 66 passengers and 635 employees killed in train service accidents in these three months of 1916, a decrease of 39 per cent in fatalities to passengers and nearly 8 per cent in fatalities to employees, as compared with the average number of casualties for the corresponding months of the five years preceding.

The record of all train-service casualties for the entire fiscal year 1916, moreover, shows almost 10 per cent less casualties to passengers and over 20 per cent less casualties to employees than the average for the preceding five years, notwithstanding the great increase in traffic. Passenger traffic did not increase in 1916 over the preceding years to as great an extent as freight traffic, but it is well known that fluctuations in freight traffic have even a more marked influence upon the accident record than fluctuations in passenger traffic.

The average number of passengers, employees and other persons including trespassers, killed in the three months, July, August and September of each of the years 1911 to 1915, inclusive, is shown in the table, together with the number of each class killed in the corresponding months of 1916, and the percentage of increase which the number of each class in 1916 is of the average for the preceding five years:

	Passengers	Employees	Other Persons	Total
Average 1911-1915	109	689	1,972	2,770
1916	66	635	2,080	2,781
Increase or decrease, per cent.	D39.4	D7.8	5.5	0.4

Against this decrease of 39.4 per cent in number of passengers killed in July, August and September, 1916, as compared with the average for ten corresponding months of the five preceding years, there appears an increase of 5.5 per cent in the number of other persons killed, making an increase of 0.4 per cent in the total number of all persons killed; while the increase in freight traffic, comparing the same periods, was at least 22.7 per cent. But "other persons" are about five-sixths of them trespassers, and no amount of care in railway operation can be successful in eliminat-

ing casualties to this class until it is supported by the enactment and enforcement of suitable legislation.

When the record for the whole fiscal year 1916 is taken in comparison with that for the whole of the preceding five years, the statistics show an improvement as to all classes. In the same form as in the preceding the table following shows the comparative record:

	Passengers	Employees	Other Persons	Total
Average 1911-1915	313	2,871	6,588	9,772
1916	283	2,273	6,322	8,878
Increase or decrease, per cent.	D9.6	D20.8	D4.0	D9.1

The data given in the foregoing include all fatalities due to the movement of trains. The number of fatalities merely from collisions and derailments was smaller in 1916 than in any one of the last 15 years except 1915.

PROPOSED SOLUTION OF THE CANADIAN RAILWAY PROBLEM

THE *Railway Age Gazette* has given a good deal of study to the majority and minority reports of the Canadian Royal Commission on Transportation, abstracts of which were published in our issue for May 4. The more we have studied them the less have we been able to regard as sound the plan recommended by the majority members of the commission, Sir H. L. Drayton and W. M. Acworth. As indicated in a previous comment in these columns (issue for May 11, page 985), the majority of the commission say that government ownership and management almost invariably have been a failure in democratic countries, and at the same time recommend the acquisition and operation of most of the railways of Canada by a government board of trustees.

When the comments in our issue of May 11 were written we had not had opportunity to read the full majority report. Having now read it we find that it is one of the most able, sweeping and conclusive analyses and condemnations of government ownership in democratic countries ever written. While it is somewhat general in its references to government ownership in other countries, it is specific in its comments on the results heretofore produced by government management of the Intercolonial of Canada. There is not a count in the indictment of that road presented previously in the *Railway Age Gazette* which the majority report does not sustain and amplify. It also concurs in all the strictures which have been made on the government construction of the Transcontinental. In addition, the folly which within recent years has characterized the Canadian government's policy in promoting the excessive and highly duplicated construction of railway mileage is made painfully clear. If there is any one point which both the report of Sir H. L. Drayton and Mr. Acworth, and the minority report of A. H. Smith cause to stand out more prominently than all others it is that the road of government ownership and management is for Canada the high road to political and economic disaster. Is it remarkable, then, that the more we have studied the reports the more we have wondered at the plan recommended by the majority of the commission?

The principal suggestions made by Mr. Smith are: (1) that the Grand Trunk shall take over and operate the eastern lines of the Canadian Northern; (2) that the Canadian Northern shall take over and operate the Grand Trunk Pacific lines in the West; (3) that the government through a board of trustees shall take over and lease the lines between North Bay and Winnipeg, except, of course, those of the Canadian Pacific, to either the Canadian Northern or the Grand Trunk, and if neither applies to some other qualified company. In other words, he would have the Canadian Northern confine itself to the West and the Grand Trunk to the East. Each would thus have a well-defined territory in which it would be able to eliminate much of the present duplication of mileage and service. He suggests no change in the government operation of the Intercolonial and the eastern part of the Transcontinental.

The scheme suggested by Sir H. L. Drayton and Mr. Acworth is, in brief, that the government shall take over the Canadian Northern, the Grand Trunk and the Grand Trunk Pacific and delegate their management, together with that of the Intercolonial and the Transcontinental, to a board of trustees. The first members of this board of trustees are to be named by Parliament and their successors are to be named by the governor-general in council on the nomination of the members of the board themselves.

Mr. Smith's plan is an out-and-out plan of private ownership management, except with respect to the Intercolonial and part of the Transcontinental. Since the other members of the commission agree that private management is preferable to government management, why did they not concur in it? The answer is to be found in the financial relations which exist between the government of Canada and the Canadian Northern and the Grand Trunk Pacific. The government in the form of guarantees of bonds, land grants, etc., has furnished very much the larger part of the capital which has been invested in these properties. Both of them have thus far proved so unprofitable that the government has had to make advances on its guarantees, and whether they are left in the hands of private companies or taken over by the government the latter will have to make good deficits for them for some years to come. The great objection made to leaving them in private hands is that the public would have to support them financially during their present period of stress and adversity, while if later they became successful enterprises private companies would enjoy the benefits of their prosperity.

But is this a valid objection? The matter should, of course, be looked at entirely from the standpoint of the present and future welfare of the people of Canada. Their welfare, so far as these railways are concerned, will be determined, first, by the quality and adequacy of the service rendered by the railways to the public, and, second, by the total amount in rates and in taxes which the people have to pay for this service. It is perfectly evident that the quality and adequacy of the service of these railways and the amount which directly and indirectly it will cost the people of Canada will depend mainly upon the efficiency with which the properties are managed. It is also certain that in order to secure under private ownership the greatest efficiency in management it would be necessary for the government to hold out to the private owners the prospect of ample reward for developing and operating the properties efficiently.

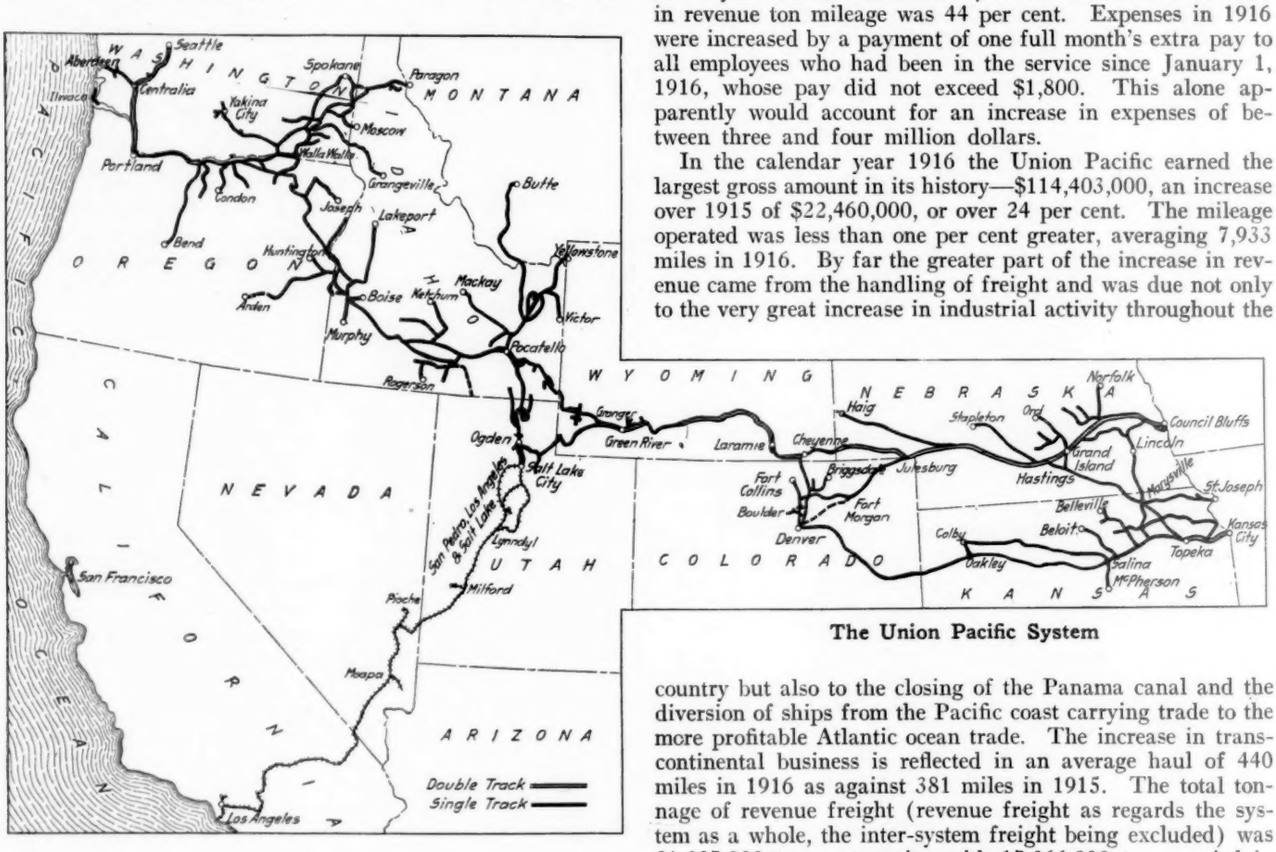
But is the giving of ample reward to the owners and managers of private railway companies incompatible with securing the best and cheapest service for the public? On the contrary, a large part of the report of Sir H. L. Drayton and Mr. Acworth is devoted to demonstrating the proposition that ordinarily under democratic conditions the public will secure good and adequate service at less cost to itself by leaving the railways in private hands and letting their owners enjoy a reasonable profit than by itself taking over their ownership and operation. Therefore, as between private ownership and government ownership and operation in the ordinary form, the majority of the commission would prefer the former. They say so expressly.

They suggest, however, a plan which they regard as a compromise between private management and direct government management. The plan they have suggested undoubtedly would be better than the sort of direct government management which has caused the Intercolonial Railway to be a failure for 50 years. But, as Mr. Smith suggests, if one parliament can create a government board to manage this great proposed system of 20,000 miles, why can not another parliament abolish the board and turn the entire system over to political management under the minister of

railways? The majority of the commission agree with Mr. Smith that it would be far better to leave the present private railways in private hands than to have this occur.

Suppose that the board of trustees proposed should be created and should be given all the authority suggested and left to exercise it without interference from parliament. Would efficient management be secured even then? The management, under the restrictions proposed, would be better than direct government management, but that it would be as enterprising and efficient as private management seems most doubtful. In the first place, the board of trustees would not have the same incentive to cause the properties to be operated enterprisingly and efficiently as a board of directors of a private company has. In the second place, it is not probable, as able men could be secured for trustees as could ordinarily be secured for railway directors and officers because the trustees would be required, as we understand it, to give up all their other business connections and devote themselves entirely to the affairs of the railway system. In the third place, a board of trustees devoting itself entirely to the management of the railway system would be a clumsy device for management. Any commercial concern to be successfully managed must have its executive work conducted under the direct supervision, not of five men, but of one man. Only under this system is there certainty of responsibility, promptness of decision and celerity of action. As the actual executive head of a railway system four men would be better than five men, three men better than four men, and one man better than any other number of men.

If the Canadian government should adopt the plan proposed by Sir H. L. Drayton and Mr. Acworth the experiment would be a highly interesting and instructive one. In our opinion, however, in the long run the interests of Canada will be most surely promoted by the adoption of some such scheme as that suggested by Mr. Smith, under which the ownership and management of the present private railways would be left in private hands subject to thorough and effective government regulation. The best solution of the problem presented will be one under which the enterprise and efficiency of private management will be so enlisted by the government as to keep the cost of rendering good and adequate service at the lowest possible figure.



The Union Pacific System

UNION PACIFIC

IT is hard to conceive of a railroad, doing the amount of freight business which the Union Pacific does in ordinary times, taking care of nearly half as much business again with almost the same average number of locomotives in service and without any large increase in other facilities, and moreover handling this increase in freight business and an increase in passenger business of 6 per cent, with an increase of only 25 per cent in transportation expenses. That, however, is the record which the Union Pacific established in the calendar year ended December 31, 1916. The actual increase in revenue ton mileage was 44 per cent. Expenses in 1916 were increased by a payment of one full month's extra pay to all employees who had been in the service since January 1, 1916, whose pay did not exceed $1,800. This alone apparently would account for an increase in expenses of between three and four million dollars.

In the calendar year 1916 the Union Pacific earned the largest gross amount in its history—$114,403,000, an increase over 1915 of $22,460,000, or over 24 per cent. The mileage operated was less than one per cent greater, averaging 7,933 miles in 1916. By far the greater part of the increase in revenue came from the handling of freight and was due not only to the very great increase in industrial activity throughout the country but also to the closing of the Panama canal and the diversion of ships from the Pacific coast carrying trade to the more profitable Atlantic ocean trade. The increase in transcontinental business is reflected in an average haul of 440 miles in 1916 as against 381 miles in 1915. The total tonnage of revenue freight (revenue freight as regards the system as a whole, the inter-system freight being excluded) was 21,627,000 tons, comparing with 17,366,000 tons carried in 1915. In 1916 32 per cent of the total tonnage was products of agriculture, being just about the same proportion of total freight carried as was furnished by products of agriculture in 1915 and being an increase over the 1915 tonnage carried of 26 per cent. Products of mines furnished 28 per cent of the total tonnage in 1916 as against 30 per cent in 1915, while manufactures furnished 14 per cent of the total tonnage as against a little over 11 per cent in 1915. The average rate received per ton-mile was 8.56 mills in 1916 as against 9.32 mills in 1915. This, of course, explains the difference between the increase of over 43 per cent in revenue ton mileage and the increase of 33 per cent in freight revenue. The average revenue freight trainload was 504 tons in 1916 and 460 tons in 1915.

The Union Pacific gives figures for gross tonnage behind the drawbar and it is interesting to note that although there was an increase of 9.6 per cent in revenue trainload, the av-

erage gross weight hauled by each freight locomotive was slightly less in 1916 than in 1915, being 1,158 tons last year and 1,174 tons in the previous year.

The larger amount of business handled and the changes in proportion of the tonnage of different commodities carried permitted a large increase in the proportion of loaded cars to total cars per train. The increase in loaded car mileage was 31.4 per cent as compared with 1915. In empty car mileage the increase was only 7.9 per cent. There was a considerable increase in the loading per car, the average load per loaded car-mile in 1916 being 24.25 tons as against 22.82 tons in 1915, or an increase of 6.3 per cent. This was notwithstanding the fact that the proportion of products of mines carried was much less in 1916 than in 1915.

Total maintenance expenses were greater by 15.9 per cent in 1916 than the year before, but by far the greater part of the increase was in the amount spent for maintenance of way and structures. In 1916 this was $14,406,000, or $2,750,000 more than was spent in the previous year, while maintenance of equipment expenditures amounted to $13,172,000 in 1916, an increase of $1,033,000. Track labor was very hard to get and the difference between the amount spent in 1916 and 1915 is not an accurate measure of the difference in the amount of work done. If the Union Pacific's experience was the same as some of the other roads in its territory, nearly half of the increase in maintenance of way expenses represented simply a higher cost either for labor or for material. The average expenditure per mile of main track (the Union Pacific operates 4,505 miles of main track and 4,159 miles of branch tracks) was $1,681 per mile.

The following table shows the amounts spent per unit of equipment for repairs only, excluding depreciation and retirements:

	1916	1915
Locomotives	$3,438	$3,060
Passenger-train cars	798	725
Freight-train cars	74	60

The balance sheet as of December 31, 1916, shows cash on hand $17,170,000 and time deposits $11,000,000. There were no loans and bills payable. Dividends on the common stock, declared and due in the immediate future, were $4,446,000.

The Union Pacific declared an extra dividend of 2 per cent on its common stock out of the extraordinarily large net earnings of 1916 calling for $4,456,000. The company appropriated from income for additions and betterments $3,524,000 and paid its employees earning less than $1,800 a year an extra month's wages, as noted above. This would certainly indicate a sound financial policy and a generous one. If railroads generally, where their financial condition is strong, would share unusual prosperity with their non-union employees as well as with their stockholders it would tend greatly to improve the relations between the management and employees.

Mention also should be made here of the establishment by the Union Pacific of an insurance plan for all employees earning not to exceed $4,000 a year, by which employees who have been in the service of the company a year or more get free both life insurance and accident and health insurance. The life insurance is a full year's wages to be paid in monthly installments with a minimum of $500 and a maximum of $2,500. The accident and health insurance consists of half wages in monthly installments for various periods, according to the nature of the disability. Employees leaving the service for any cause whatsoever automatically cease to have insurance as provided under this plan. Employees, however, retired on pension after January 1, 1917, will be considered in the service for the purpose of life insurance but not for accident or health insurance. This insurance plan is a new experiment for American railroad companies, but the principles on which it is founded are both generous and thoroughly sound.

The following table shows the principal figures for operation in the calendar year 1916 as compared with 1915:

	1916	1915
Average mileage operated	7,933	7,858
Freight revenue	$84,012,145	$62,987,203
Passenger revenue	20,092,807	19,671,687
Total operating revenue	114,412,607	91,952,245
Maintenance of way and structures	14,405,828	11,656,306
Maintenance of equipment	13,171,653	12,138,880
Traffic expenses	2,176,939	2,329,169
Transportation—rail	29,202,448	23,324,910
General expenses	3,225,561	2,849,385
Total operating expenses	63,704,393	53,788,298
Taxes	5,651,544	5,003,642
Operating income	45,056,670	33,160,304
Gross income	57,080,808	45,390,007
Net income	43,182,409	31,586,240
Appropriations for additions and betterments	4,367,075	1,083,459
Dividends	22,229,160	17,783,328
Surplus	12,593,811	8,726,083

CHESAPEAKE & OHIO

IN the second half of the calendar year 1916 the Chesapeake & Ohio resumed paying dividends by the declaration of 2 per cent. This was generally understood as indicating an annual rate of 4 per cent. The report for the fiscal year ended June 30, 1916, was ample justification for the declaration of this semi-annual dividend, the company having earned almost 11 per cent on its outstanding stock. In the half year, July 1 to December 31, 1916, the company has shown net earnings available for dividends at a higher per cent on the stock even than in the previous fiscal year. In the full calendar year 1916 the company earned $49,834,000, an increase of 14.35 per cent over the operating revenues of 1915, and after the payment of expenses, taxes, interest and rentals there was $7,667,000 available for dividends, or an equivalent of 12.21 per cent on the outstanding stock, and representing an increase as compared with the previous calendar year of 50.57 per cent. The declaration of 2 per cent calling for $1,256,000 out of the earnings of the calendar year 1916 was therefore very conservative.

The Chesapeake & Ohio should for some years to come make considerable expenditures on capital account from net earnings belonging to the stockholders. The road has a large funded debt per mile of line, and since under present financial conditions raising new capital by the issue and sale of stock is an impossibility, net income belonging to the stockholders will have to be used for capital purposes.

There is another consideration, however, in the case of the Chesapeake & Ohio which is very important. The company has outstanding $40,180,000 5 per cent 30-year convertible bonds. These bonds are convertible up to April 1, 1920, into common stock at 75; between 1920 and 1923 into common stock at 80; between 1923 and 1926 at 90, and after that up to April 1, 1936, at par. The company's financial condition would be greatly strengthened if the greater part of these bonds were converted into stock within the next few years. If such a conversion were to take place the Chesapeake & Ohio would have succeeded indirectly in doing its financing by the issue of stock. In the present market the convertible 5's are selling in the neighborhood of 86 and the stock, which if the semi-annual dividends of 2 per cent are continued is a 4 per cent stock, at about 58. There is presented here a nice question. Which would be more likely to bring the market price of the stock up to a point at which holders of the convertible 5's would exchange their bonds for stock; a continuation of a very conservative dividend rate, with the investment of as large sums as are available from net, after the payment of this dividend, in the property; or the increase of the dividend rate to 5 or 6 per cent, with the correspondingly smaller investment of net income in the property? Theoretically, under present conditions of railroad financing it would be a sounder policy to continue the 4 per cent dividend rate and pile up an equity in the property for stockholders; but it is not a theoretical question but a practical one which confronts the management. Would this policy actually induce conversion of bonds for stock on

a large scale? There can hardly be two opinions about the fact that the all-important thing is to change the present fixed charge of about $2,000,000, representing the interest on these convertible bonds, into a non-fixed charge.

This discussion, of course, is based on the assumption that the Chesapeake & Ohio is going to continue for some years to earn net available for dividends of 10 or over 10 per cent. There is every prospect that gross income will continue at as high or an even higher rate than at present. There is very little likelihood of a falling off of demand for coal, and coal forms nearly 70 per cent of the total freight tonnage carried by the Chesapeake & Ohio and present prospects are that manufactures, iron and steel, etc., will move to tidewater in increasing volume.

The rub will come in the increase in expenses. The Chesapeake & Ohio has a remarkably heavy trainload. In the calendar year 1916 it averaged 1,007 tons of revenue freight. This means, of course, that a very large proportion of the total freight carried is in slow freight trains where the effect of the eight-hour law in increasing wages will be most likely to be felt. In the calendar year 1916 old contracts for fuel permitted the Chesapeake & Ohio to get its fuel coal at about the same price as in recent years, but these contracts have expired since the close of the calendar year and the Chesapeake & Ohio has had to pay the prices that are now current. Unlike some of the anthracite carriers, the Chesapeake & Ohio does not own and mine coal. It is not, therefore, in the position of nominally paying higher prices for coal, but actually only paying the increased cost of production, as are some of the anthracite coal roads. To overcome this the Chesapeake & Ohio has recently bought, or at least contracted to buy, a coal property which it is pretty surely the intention of the management to operate. This coal property will furnish the Chesapeake & Ohio with a part of its fuel coal, so that fuel costs ought not to increase by any means to the extent that fuel costs will go up on most other roads.

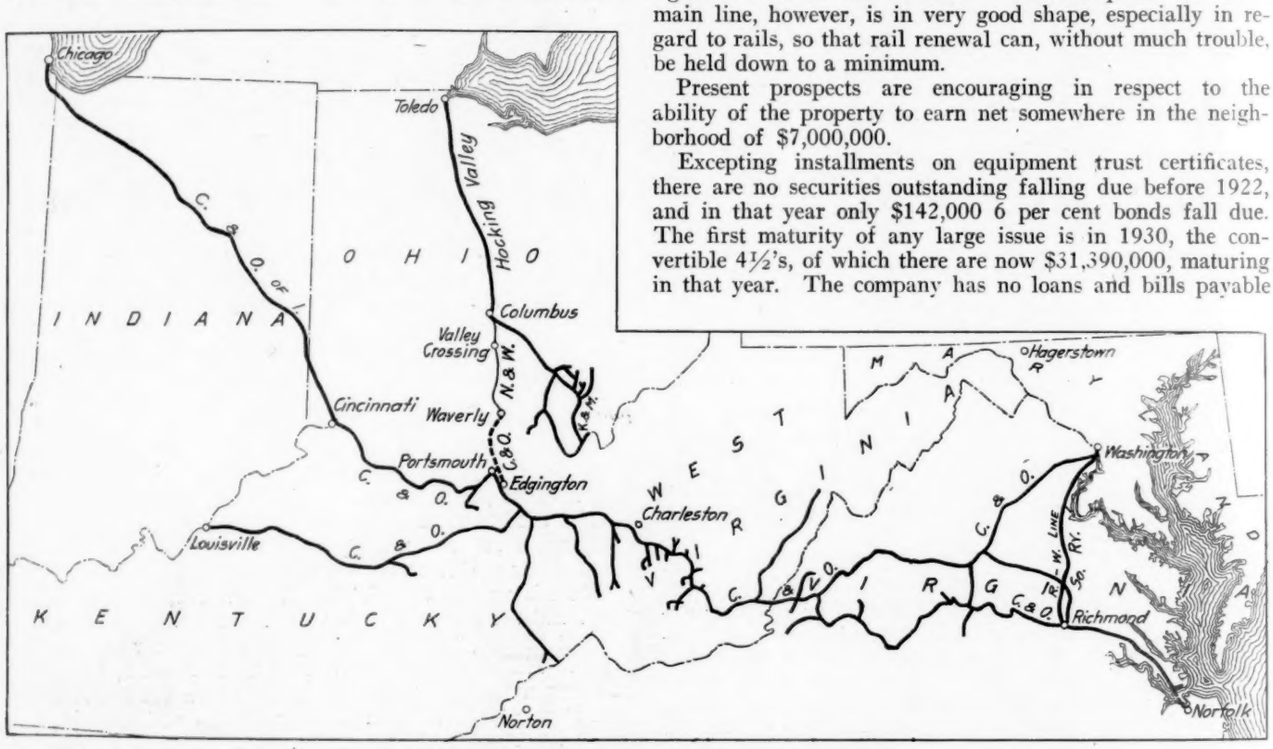
As to prices for materials, the Chesapeake & Ohio will be no better off than other roads, except insofar as it is in a better position to withhold buying. The equipment situation is good. During the calendar year 1916 the company bought 2 Pacific, 1 Atlantic, 34 Mallet, 6 Consolidation and 2 Shay locomotives. The company had at the end of 1916, 111 Mallets, 56 Mikados and 480 Consolidations, and in passenger service had 130 locomotives with an average weight on drivers of 59 tons. The heavy freight locomotives are, of course, in addition to some smaller locomotives and switchers.

At the end of 1916 the Chesapeake & Ohio had 46,513 freight train cars, which included 770 tool, camp and ballast cars. The coal and coke cars had an average capacity of 54.68 tons. If the Chesapeake & Ohio could get its cars promptly returned it would have an ample supply for even the present large demands of its shippers.

As to road, of the total 1,565 miles of line 616 miles is laid with 100-lb. rail, 384 miles with 90-lb. rail and 250 miles with 85-lb. rail. Apparently such rail renewal as is being done is the replacement of the 90 and 85-lb. and lighter rail with 100-lb. rail. The Chesapeake & Ohio's main line, however, is in very good shape, especially in regard to rails, so that rail renewal can, without much trouble, be held down to a minimum.

Present prospects are encouraging in respect to the ability of the property to earn net somewhere in the neighborhood of $7,000,000.

Excepting installments on equipment trust certificates, there are no securities outstanding falling due before 1922, and in that year only $142,000 6 per cent bonds fall due. The first maturity of any large issue is in 1930, the convertible 4½'s, of which there are now $31,390,000, maturing in that year. The company has no loans and bills payable excepting $95,000, which nominally comes under that head, and at the end of 1916 had $8,276,000 cash, besides the cash deposited to pay interest and dividends or other matured obligations.



The Chesapeake & Ohio and the Hocking Valley

The following table shows the principal figures for operation in the calendar year 1916 as compared with 1915:

	1916	1915
Mileage operated	2,381	2,374
Freight revenue	$39,888,932	$35,198,357
Passenger revenue	6,435,025	5,713,463
Total operating revenues	49,834,312	43,580,841
Maintenance of way and structures	6,067,658	5,112,084
Maintenance of equipment	10,240,498	8,980,825
Traffic expenses	675,381	631,012
Transportation expenses	14,355,565	13,197,860
General expenses	1,035,932	886,141
Total operating expenses	32,698,676	28,998,626
Taxes	1,636,604	1,445,685
Operating income	15,486,677	13,120,358
Gross income	17,127,820	13,954,351
Net income	7,666,882	5,092,021
Dividends	1,255,632	.....
Surplus	6,411,250	5,092,021

Letters to the Editor

COMBINED OWNERSHIP OF FREIGHT CARS

SILVIS, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

As a suggestion to promote greater efficiency in the use of railroad-owned rolling stock for commercial shipments and company freight moving similar to revenue consignments, the thought has come to the writer that one corporation should own and control all of the box, stock, coal, flat, automobile, refrigerator and other cars now owned by transportation companies in the United States, Canada and Mexico; reserving to railroad ownership, special equipment for work train and construction use and such other equipment as would be used entirely on the rails of the owning line. This would include passenger train equipment, business cars, shop yard equipment and wrecking outfits.

The equipment corporation, or, if you please, the "Car Equipment Trust of America," could be composed of all the transportation companies operating standard gage. All companies would pay the equipment trust for the use of the cars at the rate they are now paying foreign lines for the use of their cars, or some adequate rate which experience would teach to be reasonable. The railroads could maintain their repair yards and be paid by the trust for repairing or rebuilding damaged or worn-out equipment, having a representative stationed at each repair yard to check up the repairs and approve the bills, or repair yards could be turned over to the trust to do all such work.

Stock in the trust could be awarded to the transportation companies in lieu of the equipment turned over to the trust at an appraised value which would be equitable. As the trust would then be owned by the railroads it would of course be controlled by them, the directors being elected by the stockholders, the same as any other stock company. All cars would be "foreign" and at the same time all cars would be "at home" when on the rails of any railroad stock owner in the equipment trust. Many hundred thousand miles of empty haul would be saved in rushing empty cars home. A short time after becoming organized a move would be made to standardize the equipment, and a few years after this standardization has taken place we would not have a hundred styles of door fastenings, a bolster would be a bolster and we would not have to wait for one to come from Savannah to repair a Central of Georgia car. Brake beams would be similar, as would also be trucks, drawbars, knuckles, draft gears, underframes, etc.

The trust could take over car building plants on the same basis that transportation companies acquire stock, or, if this is undesirable, build their own car shops for turning out new equipment, but if such plants are properly located it would seem that it would be to the mutual interest of all parties to take them into the trust. Some might advance the theory that this would result in a dearth of cars in one territory and a surplus in another, but that is nothing more than is happening under the present plan. It is reasonable to suppose that no road is going to hold cars beyond the number for which they have immediate use for the fun of paying per diem any more than they do now. The proper distribution would have to be worked out the same as many other transportation problems that are constantly coming up.

C. W. THATCHER,
Agent, C. R. I. & P.

UNIFORMS FOR WOMEN CAR CLEANERS

CINCINNATI, Ohio.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The illustration herewith, taken from the Railway Gazette of London for April 6, shows the staff of women engine cleaners at the Low Moor district sheds of the Lancashire & Yorkshire Railway of England.

A Group of Women Engine Cleaners in Their Natty Uniforms

My special point is in regard to the uniforms and the caps.

American railways employ a good many women car cleaners, and so far from conforming their costume to the necessities of the case, it is a common thing to see a woman car cleaner carrying a bucket and mop and arrayed in all the faded glories of one of Solomon's wives.

The efforts of some of these women to maintain their standing as society leaders by wearing hats decorated with

feathers and plumes while moving from one job to another in the coach yards is pitiful, and is based on a wrong conception of their duties.

Why should not a movement be put on foot to have these women workers around railway premises adopt a standard dress similar to that shown in the attached picture?

T. C. POWELL,
Vice-President, Southern Railway.

THE TRANSVERSE FISSURE PROBLEM

NEW YORK, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Referring to your issue of March 23, 1917, containing an article entitled "An Elaborate Study of Tranverse Fistures"; I have read with much inetrest James E. Howard's report of his very ingenious experiments incorporated in H. W. Belnap's report of February 12, 1917, to the Interstate Commerce Commission on the accident on the Southern Pacific Company's line near Iser, Texas. Mr. Howard's interpretations of the results of his experiments lead him to conclusions which seem to me entirely unwarranted and unproven, for reasons which I shall state.

Considering the parts of Mr. Howard's report in the order in which they are presented:

1. Examination of Broken Pieces from Iser, Texas.—The examination of the broken pieces from Iser, Texas, appears to have been thoroughly and conscientiously made, and Mr. Howard claims to have found no abnormal conditions except those characteristics which would fit in with his conclusions. He seems to have overlooked the segregation of elements shown in his Table 1—high phosphorus and carbon in every case at the transverse fissure location, low silicon and corresponding low ductility shown in Fig. 5 in the same spots. This evidence of segregation is important because locally such conditions might be serious enough to start the nucleus of a transverse fissure. The maximum initial tension found anywhere was in the center of the base of section 10-A, in a place further from the neutral axis than the transverse fissures, with initial compression in the flange each side of this, a condition not dissimilar to that claimed for the head. Now, in accordance with laws of mechanics and not forgetting Mr. Howard's conclusions, why did not a transverse fissure start here? If it is a straight matter of initial stress and repeated reversals under loads, why do not transverse fissures start where these condition are worst? "It (transverse fissure) is a tension fracture and occurs where the tensile stresses reach a maximum." (Page 42, line 1, of the report.) These test results, ignored in the text of the report, are vital as affecting the conclusions, and indicate *faulty material in the head.*

2. Cold Rolling and Gagging Experiments.—The cold rolling experiment seems to have been a failure, but nevertheless is used in Mr. Howard's conclusions. The fact that smaller changes were caused in the initial internal stresses by larger wheel loads is significant, but it is waved aside by Mr. Howard with the statement that probably still larger wheel loads or other conditions would have given the results he wanted. The depth of penetration of the cold rolling effects is stated by him to be superficial in his experiments. It was found, of course, that a rail cannot be rolled, bent, gagged, heated or cooled, without in some measure affecting its initial stresses. The effects of annealing, heat treating and gagging were much greater than those of cold rolling. Mr. Howard, in comparing internal strains present in one-foot sections not cold rolled with those in five-foot sections of the same rail cold rolled, explains the lack of uniformity in results as being due to the internal strains in the one-foot sections being modified by the cold sawing of the rail into short lengths. If such be the case, how can Mr. Howard consistently sustain the accuracy of the determinations on which all of his report is based, since his test specimens must necessarily have been obtained by means of similar mechanical processes?

3. Tranverse Fissures by Progressive Gagging.—The production of transverse fissures in new rails was indeed an extremely interesting feat, but the results are capable of more than one interpretation. Mr. Howard, by progressive gagging, found and developed non-ductile spots resembling transverse fissures in several new rails. He was able to detect these spots "at will" in the center of the head, on either side, but does not state that they can be detected "at will" lengthwise of the rail. In the conclusions the first appearance of fracture internally is accounted for by cold rolling effects, while in this experiment the rails were not first cold rolled and then gagged, and nevertheless internal fissures developed. Without the preparatory cold rolling how are we to explain the internal fissures except by faulty material? Why were not detailed chemical analyses and detailed internal stress measurements published for these rails similar to those carried through for the broken pieces from Iser?

4. Transverse Fissures in Very Heavy Rail Sections.—The occurrence of transverse fissures in the very heavy rail sections after very short service is certainly indicative of defective material and not of fatigue.

5. Other Types of Service Failure.—It is a fact that service is required to cause failure of any description. Pipes, slag inclusions, transverse fissures and other flaws are not readily found on inspection of new rail, but are made manifest by service. This is axiomatic but the law of fatigue has little to do with the development of any of these defects into failures.

6. Law of Fatigue of Metal.—We do not dispute the law of fatigue of metal, and Mr. Howard's statement of it is accurate. We maintain that his experiments have failed to evoke from this law an explanation of transverse fissures.

7. Arraignment of Engineering Profession.—Mr. Howard demands of the engineering profession an exact determination of track fibre stresses, surface and internal. We have searched the report in vain for a suggestion as to how this might be accomplished. Men representing the best talent in this country have spent and are spending time and labor on this with little success. These demands may be met in the distant future, but it is probable that the real cause of transverse fissures will have been found and done away with long before track stresses become accurately known. The stresses in continuous girders with yielding supports are still indeterminate by mathematical and physical investigation; but this much is known—that a maximum tension in the upper flange of any such girder can occur only over a rigid support, yet transverse fissures occur between ties as well as over ties.

8. Mr. Howard's Conclusions.—From the fact that transverse fissures have developed in rails rolled at periods separated by not less than two decades, Mr. Howard concludes that all doubt should be removed concerning any peculiar conditions having found their way into modern mill practice influencing this type of failure, but the mere fact that this type of failure is not new does not preclude defective material from being the primary cause—it simply proves that if defective material be the primary cause modern mill practice has not yet eliminated it. Mr. Howard has advanced an interesting hypothesis regarding the formation of transverse fissures, but he has not yet established this as a scientific fact. If fissures are caused solely by cold rolling and repeated reverse stresses how can the following questions be answered?

Why do transverse fissures occur in very heavy rail sections after very short service?

Why do transverse fissures never occur in the center of the base where the stress combinations and fatigue effects are worst?

Mr. Howard finds support in the statement (P. 42)".... they (transverse fissures) are not confined to any one rail

mill, nor to northern or southern mills....," but this does not fully state the case.

Designating seven rail mills in this country by letters "A" to "G," the Southern Pacific Company's records show the following transverse fissures per annum per 100 miles of track under similar conditions of service:

Mill	Transverse Fissures per Annum per 100 Track Miles
A.	0.000
B.	0.083
C.	0.216
D.	0.260
E.	0.459
F.	0.540
G.	1.087

Why should Mill G have 12 times the breaks from transverse fissures that Mill B has, or 4 times those of Mill D under similar service?

Why have not transverse fissures been discovered in rails made by Mill A?

Why are not all the old rails in heavy service falling to pieces from such fissures? (Southern Pacific Company, Pacific System, has a rate of failure from this cause of 0.028 per 100 miles per year, equivalent to but one failure in 114,000 rails per year).

JOHN D. ISAACS,
Consulting Engineer, Southern Pacific System.

GOVERNMENT TERMINAL ELEVATORS AT SEAPORTS

ST. JOSEPH, MO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

According to the statistics compiled by the Interstate Commerce Commission for the fiscal year ending June 30, 1914, the following equipment was available for the transportation of the business of the country, totalling 1,949,707,999 tons:

	FREIGHT CARS		
	Number	Aggregate Capacity, tons	Average tons
Box	1,043,796	36,622,074	35
Flat	146,133	5,214,949	36
Stock	82,971	2,597,278	31
Coal	899,314	40,583,490	45
Tank	8,530	340,722	40
Refrigerator	48,886	1,577,973	32
Other	96,017	4,040,612	42
Total	2,325,647	90,977,098	39

The box car equipment was 44.88 per cent of the total car supply and in this equipment there was transported 843,517,103 tons of the products of agriculture, wool, hides and leather, lumber, manufactures, merchandise and miscellaneous commodities, or 43.27 per cent of the total tonnage movement. It will, therefore, be seen that the box car supply was equal to the demand if equipment could be kept in service, but when the movement of freight cars is taken into consideration it will be found that the mileage made per car per day on 65 per cent of the mileage of the railways of the United States in the fiscal year 1916 was 29 miles, as compared with 26.69 miles in 1913. The average capacity increased from 38 tons in 1913 to 40 tons in 1915 and probably to 41 tons in 1916. There was an average increase in car efficiency of 17 per cent in September, 1916, over September, 1913, equivalent to an increase of 384,000 in the number of cars.

Notwithstanding the unusual efforts that were made during 1916 to expedite the movement of freight, there was on November 1, a shortage in equipment of 114,908 cars, which was reduced on December 1 to 107,778, and on December 31, 1916, to 59,892 cars. On February 1, 1917, it was reported that there were 25,000 cars destined to eastern points standing on railroad tracks west of Lake Michigan and the Illinois-Indiana boundary detained on account of embargoes. On February 15, 1917, the chief railroads of the country took summary action to relieve the shortage of freight cars and the traffic congestion at eastern seaports, which was approaching an acute stage because of the curtailment of trans-Atlantic sailings by Germany's new submarine campaign, and adopted a policy of separating empty from loaded cars in the congested yards and sending back the empties, with others released by unloading, to western lines in solid train loads, ahead of all other traffic except passenger trains. As an example of the capacity of one line, the Pennsylvania yards at Philadelphia are able to store 7,000 cars, but the unloading facilities are only 1,800 cars per day.

The Interstate Commerce Commission, in its report for the year 1916, has this to say with respect to car shortage:

"Whenever business generally is good and times are prosperous there is a wide-spread difficulty and complaint due to inability to secure satisfactory transportation services from the railroads. This difficulty recurs practically every year with regard to transportation of coal, and usually in connection with the movement of grain when the crops are good. If the number of cars available for loading were doubled or trebled the situation would thereby be made worse, due to the fact that the additional number of cars loaded could not be promptly transported and to inadequacy and congestion of terminals, which congestion, in turn, is due in part to failure of consignees promptly to receive and remove their freight. . . . It seems to us beyond question that largely increased railroad facilities are necessary adequately to handle the commerce of the country, and that in some way those facilities must be provided."

The movement of grain by all railroads in the United States for the year ending June 30, 1914, was 46,015,410 tons, or 4.2 per cent of the total tonnage moved, and the box car equipment had an aggregate capacity of 36,622,074 tons, so that to move the grain and the other commodities totaling 843,517,103 tons, would have required but 23.4 single movements in the course of 12 months. However, owing to delays in yards and at loading and unloading points, the average freight car movement per day is low.

During 1913 there were produced in the United States 730,267,000 bu. of wheat, of which only 91,600,110 bu. were exported, or the equivalent of 78,514 cars of 35-ton capacity, and during the same year there was exported 50,780,143 bu. of corn, the equivalent of 40,624 cars of 35-ton capacity, or a total single movement of 119,138 cars.

In 1911 the elevator capacity of Chicago was 30,000,000 bu., and there was received at that point 239,336,000 bu. of wheat, corn and oats, or 96,955,747 bu. in excess of the number of bushels of wheat and corn exported from the United States in the year 1913.

When grain is moving it is not unusual to have from 5,000 to 15,000 cars loaded with grain at a seaport. Is there anything unreasonable in the suggestion that the Government should supplement the unloading facilities at seaports by the investment of $25,000,000 in terminal elevators, so as to relieve the congestion brought about by the movement of 119,138 cars carrying grain to the vessel side?

If this is thought to be an unwarranted suggestion, may we not refer to Government investments at the Panama Canal, where 25,764 people are at work on the Panama Railroad 47 miles long, along the canal, and on six ocean-going steamers, and where in addition to docks and railroad terminals the Government has recently put up enormous coaling stations. What for if not to assist the people of the United States in moving coast-to-coast traffic? We, as taxpayers, are called upon to foot the bill as the tolls do not produce sufficient revenue on the tonnage passing through the Canal, approximating 157,143 carloads in the last year, to pay the expense of operation and maintenance. Government owned terminal elevators at our seaports would be revenue producing and would go a long way toward removing congestion of traffic at eastern and southern outlets.

Is it not the province of Government to provide these terminal facilities at seaports as they have done at the Panama

Canal, or suggest in some tangible manner the methods that should be adopted by the carriers to ameliorate the conditions brought about by this congestion at the seaboard and do away with the necessity for embargoes on the traffic of the country? In the language of the Interstate Commerce Commission: "It seems to us beyond question that largely increased railroad facilities are necessary adequately to handle the commerce of the country, and that in some way those facilities must be provided."

F. R. WARRICK.
President St. Joseph (Mo.) Grain Exchange.

CENTRALIZATION OF CAR DISTRIBUTION

CHICAGO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

There is nothing in the present situation to encourage the hope that the railroads by voluntary action will be able to unite on a plan to govern the distribution and use of foreign cars. The American Railway Association has probably done all that it can to remedy the difficulties the railroads are confronted with in dealing with this proposition, but it lacks the power to enforce its decrees upon dissenting members; consequently any action it may take has no effect and is void.

Rules to govern the handling of foreign cars have been framed, modified and remodified a great many times since the per diem plan was inaugurated in 1902, but these rules are not only lacking in their essential principles, but are fundamentally wrong, because they are founded on the theory that the use of freight equipment in all sections of the country can be controlled by cast iron regulations which make no provision for meeting constantly changing conditions. Besides that they are dependent upon the will and caprice of the individual for observance. Adequate penalties in case of failure to observe the rules have not been provided, and the power to punish offenders has not been created.

If a solution of this problem is reached, it will have to be done by a commission supported by sufficient authority to enforce its mandates upon all the railroads, and if the authority to create such a body does not now reside with the Interstate Commerce Commission, it should apply to Congress for it. Then a commission, consisting of competent transportation men of high character, sufficient experience and national reputation, and a representative of the Interstate Commerce Commission, should be created and vested with necessary power to enforce its orders. The commission should have its headquarters in Chicago because of its central location, and should superintend the distribution of cars as between the railroads. It should have jurisdiction over the movement of freight and be empowered to regulate or restrict the flow of traffic in any direction when necessary to prevent congestions at commercial centers or elsewhere. It should have the power to exercise supervision over the repairs of cars and locomotives, and to prescribe that no car in unserviceable condition shall be offered in interchange, either loaded or empty. It should be empowered to require railroads to make necessary reports to enable it to work intelligently, and to decide promptly all questions presented to it. The country should be divided into zones for the purpose of car distribution, and a commissioner placed in charge of each zone.

It matters little what rules are adopted, but the fewer the better, as the commission would undoubtedly regulate the movement of cars from time to time as might be necessary to take care of the varying situations as they arose, something no rules could possibly do, not directed by human intelligence and legal authority.

For instance, it is a self evident truth that when the outbound tonnage is greater than the inbound, the excess movement of loaded cars must be offset by a countervailing inbound movement of empty cars; otherwise the outbound ceases; and when the inward tonnage is in excess of the outbound, the reverse is true. This applies particularly to traffic in the bituminous coal districts, where at certain seasons of the year it is necessary that open top cars should be returned with the utmost despatch. It is pretty difficult for an unprejudiced observer to see wherein the owner of an open top car is interested in its employment in the handling of commodities originating on other railroads at a time when he is short of cars at the mines and needs every unit of his equipment to keep the mines constantly working, so that the maximum out-put may be maintained with assured regularity. It would fall upon the commission to regulate by a positive prohibition, the employment of open top cars by non-owners under such circumstances.

During the time, however, when the supply of open top cars is greater than the demand, the owners would undoubtedly prefer to have them employed by other railroads in the movement of any traffic at going per diem rates, and this would also be a matter for the commission to regulate for the best interests of all concerned.

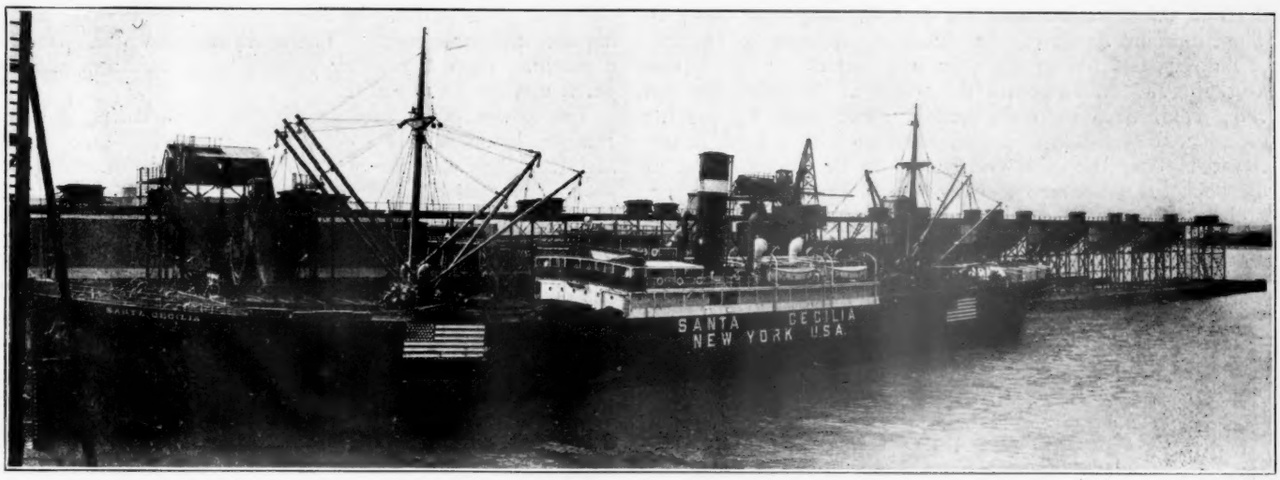
It is an undeniable fact that the movement of traffic has always pooled box cars, and there does not seem to be any good reason why it should not continue to do so. It seems to be for the interest of all concerned that it should be permitted, and that a closed car should be available for a load wherever it may be, without reference to who owns it, or where the shipment may send it. The problem that would confront the commission as to the use of closed cars differs somewhat from that of other cars. The movement of empty cars from one district to another, and from one railroad to another in order to meet the needs and requirements of situations as they arise, so as to maintain a fair and equitable distribution of the carrying capacity, is the problem the commission would be expected to work out.

The field of car service has never been fully explored for the exercise of economies and the promotion of efficiency. To the mind of the average railroad man it presents an impenetrable forest of suspicion, doubt and selfishness; and if it is not placed in the hands of an impartial tribunal with sufficient authority behind it to enforce its decrees, coordination, uniformity, system and efficiency in handling the traffic of this country will remain moral and physical impossibility.

It must be apparent to those who have the interests of the railways most at heart that if they are to escape drastic legislation that would probably hamper and restrict the freight business of the country, and be burdensome and expensive to the railroads, they must co-ordinate their affairs and so unite that a situation similar to the one existing today may never again arise.

OPERATING OFFICER.

ECONOMY IN THE USE OF ENGLISH FREIGHT CARS.—In view of the extreme importance of securing that the utmost possible use shall be made of the available supply of freight cars, the English Board of Trade has now issued orders, which came into force in Great Britain at the beginning of April, fixing the times beyond which the retention of a freight car by a trader will be an offence under the Defence of the Realm Regulations. The times allowed are, in general, one complete day for loading and two for unloading. Three days (four in Scotland) are allowed for unloading shipment traffic at ports, and two days are allowed in Scotland for loading cars with coal for shipment. The orders do not apply to coal traffic in England and Wales. Further orders give power to railway companies themselves to unload cars which are not unloaded by the trader within the prescribed times, and to make use of private owners' cars on the return journey, so that the unnecessary haulage of empty cars may be avoided. These orders are being printed as Statutory Rules. Where necessary the periods at present allowed before demurrage charges accrue will be amended so as to accord with the period fixed by these orders.



Coaling a Vessel

Pennsylvania Export Pier at Baltimore

A Description of New and Modern Facilities Completed for Transferring Coal and Coke from Cars to Vessels

THE Pennsylvania Railroad is now completing the construction of an export coal pier at Canton, Baltimore, that will, when completed, furnish enlarged facilities for loading coal and coke for harbor, coastwise and export shipments. The pier is located on the Patapsco river directly across the river from Fort McHenry and on the line between the city of Baltimore and Canton, Md. The work is well under way, and it is expected that the plant will be placed in operation about February 1, 1918.

The new facilities are being built to replace an old and out-of-date pier that is now in service near the site of the new structure. The coastwise and export business handled consists of bituminous coal and a limited amount of coke. The bituminous coal comes from the Pennsylvania fields in the Clearfield, Greensburg, Westmoreland and Pittsburgh districts. In addition to the coal handling facilities at Baltimore, the Pennsylvania has extensive and modern facilities at Greenwich Point, Philadelphia, for the handling of export and coastwise coal.

The project at Canton includes a reinforced concrete pier 942 ft. long and 66 ft. wide, equipped with electrically-operated vessel loaders, a power house of brick and concrete, a car dumper and the necessary machinery, a steel trestle 1,600 ft. long which carries a narrow-gage track from the car dumper to the pier, the necessary yard facilities and the dredging of a channel on each side of the pier. In addition the plans provide for a thawing house in order that the operation of the pier will not be hampered in cold weather. This house, which is to have a capacity of 30 cars, is to be placed over the advance yard. When coal is received frozen in the cars it will be thawed out by steam so that it can be dumped easily.

The track system consists of a loaded car yard of 36 tracks with a combined capacity of 620 cars, a thawing or advance yard of six tracks having a capacity of 79 cars and an empty yard of five tracks where space is provided for 180 cars. The track laying which was done by the company forces, involved the placing of 241,000 cu. yd. of fill, 78,000 of which was secured from the grading required in preparing the site of the plant, and the remaining 163,000 cu. yd. was borrowed at a pit three miles distant at Bay View. The material for the embankment was moved to the job in standard gage dump cars.

It was originally planned to build the pier as a timber structure consisting of a heavy floor of 6-in. by 6-in. and 12-in. by 12-in. ribs placed at the water level and supported on and framed over timber piling, the floor or deck carrying four concrete stringers and an earth fill about 4 ft. deep and having a total weight of 16,924 tons. It was found that by substituting a concrete design for the timber and eliminating the earth fill, the dead load was reduced by more than 5,000 tons, thus decreasing the number of piles necessary to carry the structure, and that a saving of approximately $18,000 in first cost might be made.

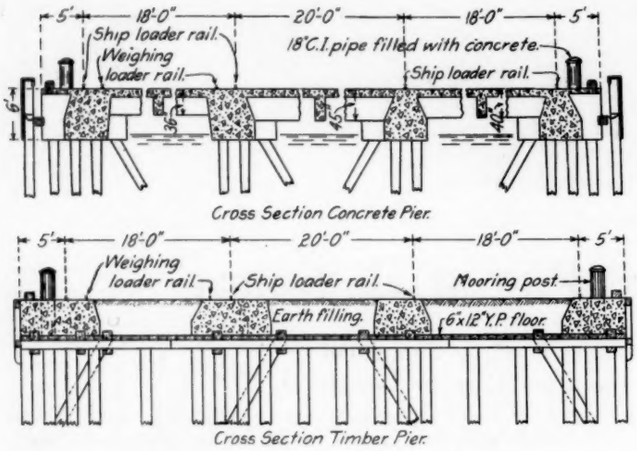
The design, as adopted, provides for a reinforced concrete pier 66 ft. wide and 942 ft. long, constructed in accordance with a patented dock design of the Cleveland Dock Engineering Company of Cleveland. It consists of four longitudinal concrete stringers, 6 ft. deep and 5 ft. wide at the base, supported on creosoted piles carrying reinforced concrete transverse beams and a 10½ in. reinforced concrete slab. The outer longitudinal beams are centered 5 ft. from the outer edge of the pier, the span between center beams is 20 ft., and that between the inner and outer beams 18 ft., while the transverse beams are placed 12 ft. 6 in. center to center. The expansion joints, seven in all, were placed 100 ft. centers, tar paper being used to prevent a bond between sections.

In driving the piles, iron ore was encountered in places at depths of 35 to 38 ft. and, because of the difficult driving, the specifications for the 65 ft. piles were changed from a 6-in. point to 9-in. In some cases it was necessary to equip the piles with shoes. When this hard driving was encountered it was decided to dredge the entire site of the pier and channel to a depth of 35 ft. below mean low tide to provide the proper draft for the vessels. In addition a trench was dredged along the pier where the carrying piles were to be placed. This trench was carried down to a depth of 42 ft. or 7 ft. below the level of the channel. The piles were then driven to an 8 ft. penetration in this trench and the 15 ft. of penetration required was secured by filling the trench with 4½ ft. of sand, covered by a top layer of one-man stone 2½ ft. deep.

In preparing the site and dredging the channel 435,000 cu. yd. of material was moved. The north channel provides for a 35-ft. draft and a width of 150 ft. for the entire length of the pier. On the south the channel is 80 ft. wide and a

draft of 35 ft. is provided for half the length of the pier. The minimum depth for the remaining distance is 18 ft.

The construction of the pier was carried on in sections averaging 27 ft. long and the width of the pier, the run being continuous for each section. The plant for placing the concrete consisted of a scow fitted up with a 2 yd. mixer, elevated above the deck and placed in the forward end of the boat. A tower and elevator placed ahead of the mixer, a clam shell placed in the rear of the boat and the necessary platforms at the mixer completed the plant. The scow



A Comparison of Pier Designs

was fitted with a boom that supported the spout for distributing the concrete.

The construction materials were brought to the site in scows, and the plant, when ready for operation, consisted of four boats. The scow carrying the mixing plant was flanked on one side by the sand scow and on the other by the one containing gravel to which was attached the fourth containing cement.

Bins for sand and stone wre provided on the mixer platform above the level of the mixer. The sand and gravel were supplied to the bins by the derrick which also handled the cement. The tower was built just high enough to spout the width of the pier properly and, as the boom was movable only in a longitudinal direction in reference to the pier, the lateral movement was secured by moving the scow close to and away from the pier. The average run for a section was 188 yd. which was placed in an average time of eight hours. The building of the pier and bulkheads involved the use of 7,200 cu. yd. of concrete, 380,000 lb. of reinforcing steel and 165,000 ft. of creosoted piling.

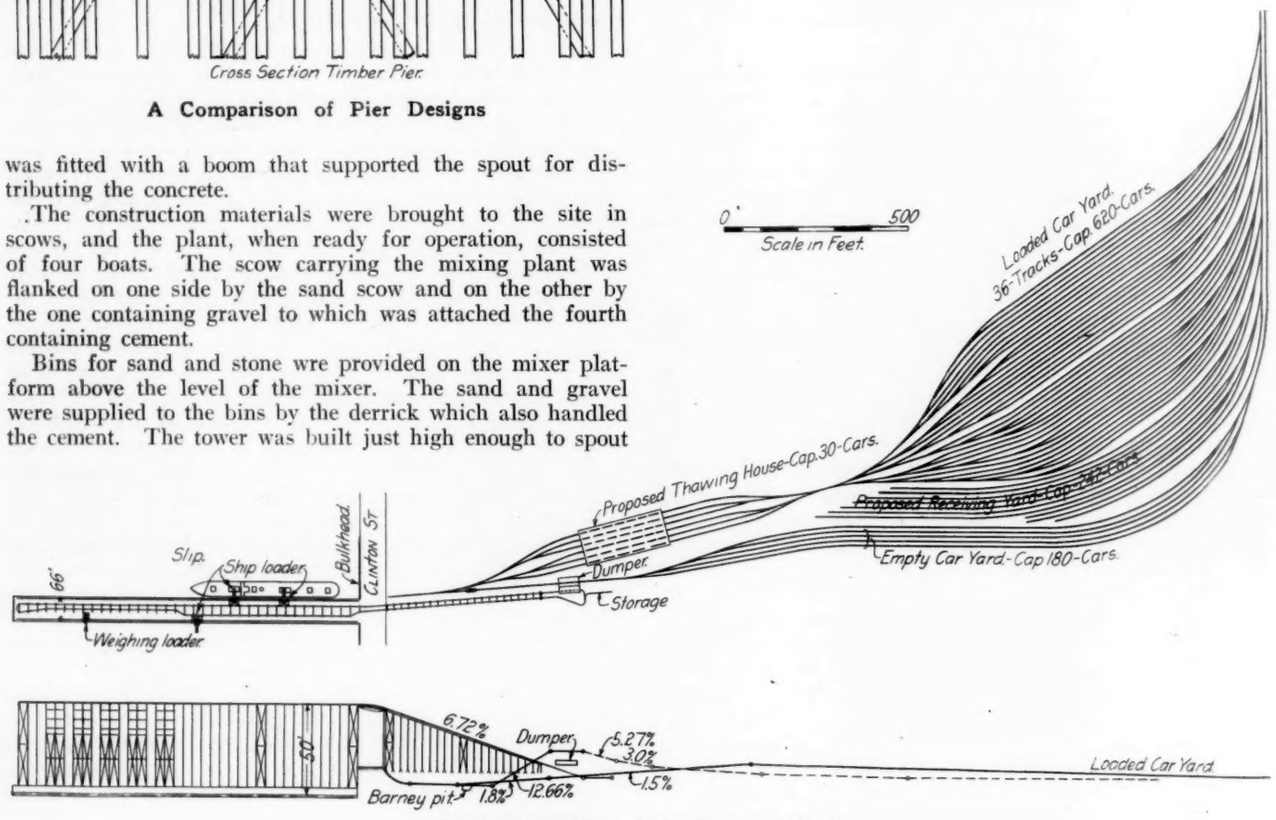
As the plant is electrically operated it was necessary to provide a power house which was constructed of brick and concrete. The building is 26 ft. wide by 88 ft. long and is divided into three rooms. The south end serves as space for a machine shop, the center portion as a storeroom and the north end as a sub-station.

The power plant consists of two transformers and two rotaries, being in fact a duplicate set with one unit operating at a time and the second one provided for emergency use. The power is secured from the Consolidated Gas & Electric Light & Power Co., of Baltimore, is delivered to the transformers at 13,200 volts and is here changed to 550 volts. The power is carried to the machines through cables and is applied direct.

As a part of the plant a Mead-Morrison design of car dumper is provided. The approaches to the machine are on an earth fill between gravity retaining walls.

As may be seen in the map the plant consists, starting at the north, of the track system, the car dumper, a power house and a steel trestle, all of which are separated from the pier by Clinton street. The steel trestle which is continued across Clinton street and connects with the trestle provided on the pier serves as a support for the continuous track from the car dumper to the pier.

The operation of the plant is particularly convenient and simple. The loaded car yard was placed to the north of the car loader and consists of 26 tracks. From this yard



Plan and Profile of the Pier and Yard

the cars are pushed through a single track throat that fans out into the six tracks of the advance yard, located east of and symmetrically with the car dumper. This yard is built on a grade to permit of gravity operation. Cars destined for the unloaders drop down from this yard to a kick-back track through an automatic spring switch. The kickback reverses the direction of the cars and delivers them to the mule pit where they are picked up by the electrically-driven mule and hauled up the incline to the unloader. The empty cars are moved from the unloader by the next loaded car

and pass down a gravity incline to the empty yard. As only one mule pit is provided, this operation is not continuous as the mule must return from the dumper to the pit before the next car is delivered from the kickback.

The unloader, which has a guaranteed capacity of 1,500 tons per hour is also electrically operated by a 300-hp. motor. The elevation of the dumper is fixed and as the cars are delivered to the platen, it and the cars are rotated, dumping the coal into a receiving bin that is equipped with four automatic outlets controlled by a 35-hp. motor through which the coal is delivered to 4-ton dump cars.

A continuous 20½-in. gage track is provided on which to transport the dump cars to the pier and return them. This track is carried on the steel trestle from the unloader to the extreme end of the pier. From the unloader to the inland end of the pier, it is on a 6.72 per cent ascending grade, crossing Clinton street at an elevation of 50 ft. above mean low tide, at which level it continues to the end of the pier.

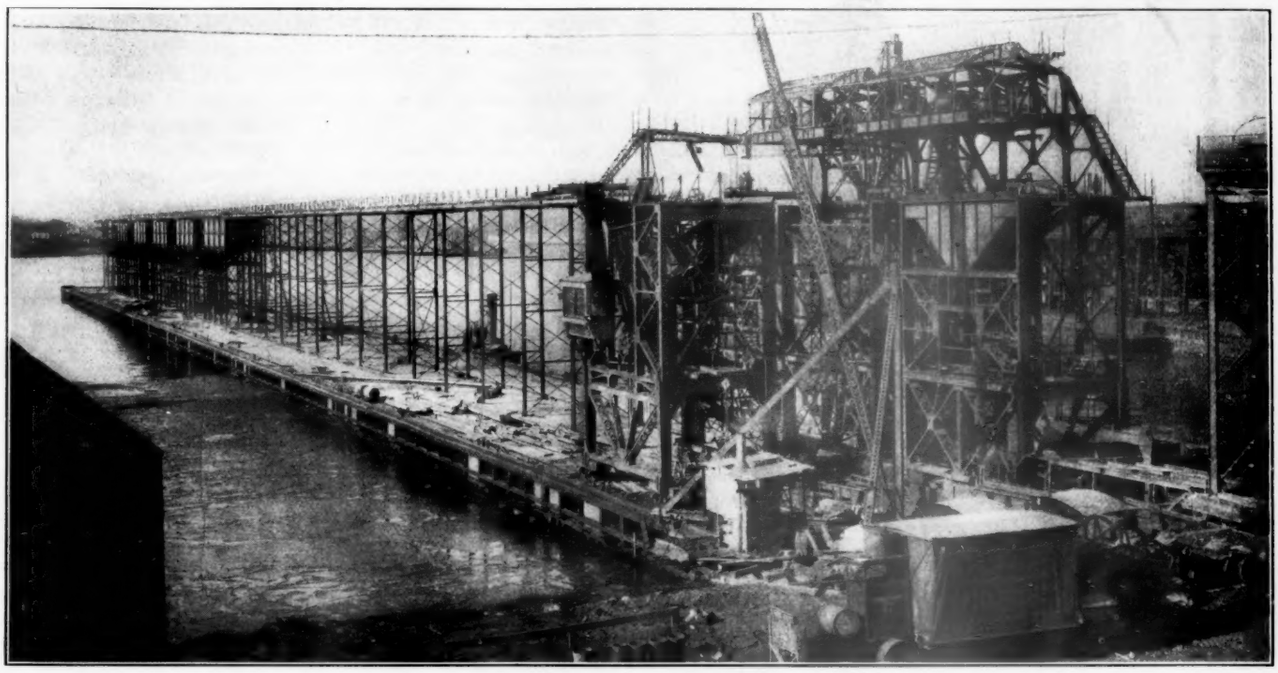
The dump cars, 50 in number, travel on this continuous track and are controlled by a 1-in. endless cable 3,600 ft. long, driven by a 150-hp. motor. Each car is mounted on standard M.C.B. trucks and is equipped with a scotch or automatic stop, in addition to the hand brake, for use in case of a breakdown. An automatic device is provided for gripping the cable.

The machinery for driving the cable is located at the inland end of the pier, 46 ft. below the track that carries the dump cars. It is so geared that the cars travel 300 ft. per minute. The cable travels from the track elevation over a sheave down to the elevation of the machinery. Two drums are provided on the machine and a regulator placed between the two distributes the power equally between them. As the cable passes over the second drum it is again carried to the track elevation in the manner mentioned above. This arrangement creates a break of about 5 ft. in the direct cable drive at the track elevation over which the cars operate by gravity, making necessary the automatic appliance for gripping the cable. As the cars approach this gap the lever that controls the grip encounters a trip that raises the lever, automatically releasing the car from the cable. When once over the gap, the trip allows the lever to resume its normal position and the grip again attaches itself.

The three vessel loaders that are provided at the pier are built up of structural steel and are mounted on eight wheels. Two tracks of 18-ft. gage are provided the full length of the pier on which the loaders travel back and forth to any convenient location for the loading of vessels. The loaders are electrically operated by motors ranging from 5 h.p. to 29 h.p., No. 1 unloader being equipped with eight motors and No. 2 with six. These two machines are operated on track No. 1, or that provided on the west side of the pier, and handle bituminous coal exclusively. Number 3 machine, which is operated on the second track, is equipped with five motors and is a combination machine handling both bituminous and anthracite coal. It is equipped with screens and a conveyor, the screenings being returned to the center of the pier by the conveyor and stored there until a cargo is accumulated, when they are loaded by means of wheelbarrows as no mechanical means is provided for this operation.

The track carrying the dump cars passes through these unloaders, each of which is equipped with a trip that, when set in the proper position, sets off a trigger on the cars, causing them to dump. Unloader No. 1 is equipped with a pan conveyor to suit the varying heights of vessels, and No. 2 and 3 unloaders with gravity conveyors. All three have a boom arrangement carrying a telescope conveyor that passes into the hold of vessels as a means of trimming the load and to prevent the dropping of coal. An operator is required for each machine.

As a means for coaling tugs and small steamers, ten 75-ton bins are placed in the steel trestle that carries the narrow-gage track. These pockets are of steel, lined with maple and are operated by undercut gates. One electrically-driven weigh loader that operates on track No. 2 is provided for the ten pockets. This weigh loader is provided with a 10-ton receiving bin mounted on a standard scale and from this bin coal may be delivered to vessels in any amount desired. An operator is also required for this machine. The line of the narrow-gage track that carries the dump cars is changed on the return side of the trestle so that it centers over the

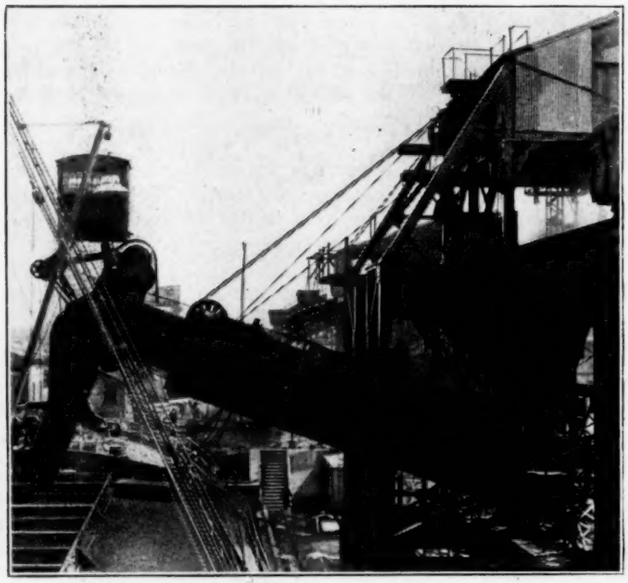


The Dock Under Construction

10 receiving bins, but once across it returns to its normal position at the outside of the trestle.

It is proposed to operate the plant in two 10-hr. shifts, or 20 hours each day. The machines have a guaranteed capacity of 1,500 tons an hour or a daily capacity of 30,000 tons.

The project has been carried out under the direction of A. C. Shand, chief engineer of the Pennsylvania, and H. C. Booz, assistant chief engineer. J. W. Craig, assistant engineer was in charge of all construction. The machines were designed and constructed by the Mead-Morrison Company of Boston, which also furnished the automatic dump cars. The dredging was done by the Maryland Dredging and Contracting Company, Baltimore, while the Arthur McMullen Company, New York, were contractors for the pier construction.



One of the Vessel Loaders

RAILWAY EQUIPMENT EXPORTS TOTAL $54,595,086 IN EIGHT MONTHS

Statistics made available Monday by the Department of Commerce showed the remarkable expansion in this country's railroad equipment export business brought about by the war. According to the latest official figures, American-made equipment of this kind exported to all the world in the eight months ending with February, 1917, amounted to $54,595,086 as against $46,425,936 in the eight months ending with February, 1916.

This sum represented not only heavy buying of equipment by Russia and France, but countries in every section of the globe whose usual European sources of supply were cut off by the war. The chief items making up the big export bill in the period were steel rails, steam locomotives, passenger and freight cars, car wheels, spikes, and track material such as switches, frogs, fishplates, etc.

Custom House records indicated that New York was the chief port for shipment of railroad supplies, whether to France, Russia in Europe and in Asia, or elsewhere, the equipment for Asiatic Russia going via the Panama Canal and the Pacific.

The eight months' record shipments were made up as follows: Steam locomotives, $7,341,802; electric locomotives, $447,329; cars (freight and passenger), $18,440,568; steel rails, $17,786,634; track material, $6,256,153; car wheels, $1,626,870; railroad spikes, $1,007,402, and railroad ties, $1,688,328.

The steam locomotive exports valued at $7,341,802 were less than the exports last year reported at $10,953,183. However, as classified by the Department of Commerce, 191 locomotives, valued at $2,072,477, went to Europe in the period, besides 18, valued at $416,978 to Russia in Asia. The other locomotive shipments, with valuations, in the period were: Cuba, 119, $1,366,620; Canada, 97, $1,171,779; China, 19, $475,243; Japan, 13, $98,501, and other countries, 65, $631,919.

Total shipments of cars for steam and other railways ran as high as $18,440,568 in the eight months in issue as against $16,571,767 last year. Russia, in Asia, took in the period cars for use on steam railroads worth $1,851,829, and European Russia $897,905, as against $2,873,430 and $10,019,774 respectively in the eight months ending February 29 last year. But. the official classification "other countries," understood to include France, showed purchases of rolling stock aggregating in value $9,539,113, against only $1,084,816 in the eight-month period last year, Cuba's rolling stock purchases footed up $3,854,979 and South America $1,044,407.

The steel rail exports of the period aggregating 421,864 tons, valued at $17,786,634 had a wide distribution. Russia's requirements were 58,266 tons, for which $2,953,609 was paid. "Other countries," including France, took 201,449 tons, worth $8,637,752; West Indies 71,605 tons, valued at $2,506,711; Japan, 6,258 tons valued at $253,201; Brazil, 1,201 tons, worth $49,301, and "other South America" 14,440 tons, valued at $609,022. Canada's purchases in the eight-month period aggregated 56,410 tons of steel rails, valued at $2,253,474, while rails also found a good distribution in Central America, Asia, and Oceania. The rail exports of $17,786,634 compared with only $11,847,615 in last year's period. There were decreases in the rail exports to Russia, but rail shipments to that country should show increases in the near future because of the orders now awaiting completion.

WORK OF THE RAILROAD WAR BOARD

A list of suggestions to the railroads as to methods for curtailing their passenger service in order to increase their capacity for handling freight during the war has been issued by the Executive Committee of the American Railway Association Special Committee on National Defense and transmitted to the railroads through the department committees located in the six army departments in the form of instructions which are serving as the basis for working out the details in the various deparments. These general instructions are described in a statement authorized by Fairfax Harrison, president of the Southern, and chairman of the Executive Committee. The instructions also relate in part to methods for increasing the efficiency of freight service. In this statement Mr. Harrison said:

"The Railroads' War Board, specially organized by the railroads to operate all the roads of the country as one system for purposes of national defense, finds it inevitable that from time to time it must recommend the adoption of policies which may prove inconvenient to the public. In doing so, however, the board will rely upon the support of public opinion. In the present national emergency some sacrifice of individual convenience is necessary to enable the railroads to increase the capacity of their lines, and to conserve the fuel supply of the country.

"As the first step in this direction, the Railroads' War Board has advised the railroads to adjust their service 'to make available the maximum transportation energy for moving fuel, food, materials, and troops necessary for the successful conduct of the war.'"

The notice that has gone out to the railroads says in part:

"1. Consolidate where practicable through passenger train service and eliminate those trains which are not well patronized.

"2. Reduce the number of special trains and give up running excursion trains.

"3. On branch lines where two trains are operated try to reduce to one train a day.

"4. Where practicable substitute mixed train service for separate passenger and freight service on branch lines. Closely review the number of scheduled freight trains where tonnage is insufficient to load them fully, with a view to reducing the number of trains.

"5. Where passenger trains are double-headed for speed, a readjustment of schedules or cutting off cars where possible will release locomotives for freight service.

"6. Reduce as far as practicable luxuries such as observation cars. In the interest of economy reduce the present rather elaborate and luxurious bills of fare on many dining cars.

"7. Move 'company' freight on underloaded trains. Operate work trains as far as possible in slack times. Store coal in slack times.

"8. Make proper train loading of primary importance with officials and trains crews. Give publicity to those making good and poor records."

Railroad Regiments for France

Instructions also have been issued by the Railroads' War Board to the railroads of the United States to take vigorous action to assist in the organizations of nine regiments of qualified railroad men for service in France. It is urgently necessary that these men be sent to France at the earliest possible moment.

Railroad executives have been asked to give immediate attention to a communication, which has just been sent to them and which is quoted in another column.

The following railway executives have been added to the membership of the department committees, in addition to those named in the article in the *Railway Age Gazette* of April 20: Northeastern department, E. J. Pearson, president of New York, New Haven & Hartford; eastern department, W. W. Atterbury, vice-president of the Pennsylvania Railroad; southeastern department, E. H. Coapman, vice-president of the Southern; central department, E. D. Sewall, vice-president of the Chicago, Milwaukee & St. Paul; and southern department, T. M. Schumacher, president of the El Paso & Southwestern.

Detail Work of the War Board

The Executive Committee continues to hold meetings at its office in Washington, giving consideration to the large number of details which arise in connection with its work of placing the railways in a position to render the most efficient service to the government. Among these are the problems in connection with the transportation of munitions and supplies for the Allies, the expediting of supplies of various kinds which are now being moved for the government, details in connection with the sending of railway regiments to France, as well as the various methods for obtaining the greatest efficiency in the use of the existing facilities of the railways. The Commission on Car Service constantly receives delegations of shippers representing various industries who present facts and arguments as to why special consideration should be given to the transportation of their products, and it also holds conferences with officers of railroads throughout the country; suggestions are made to railroad officers as to how they may meet the requirements of the various special situations which are presented by the shippers, and where individual railroads show their need for a particular number or kind of cars to meet an urgent demand, steps are taken to have the cars furnished to them. The Commission on Car Service also makes reports to the Executive Committee to aid it in deciding important questions of policy.

In addition to the many problems presented in the endeavor to secure the proper distribution of freight car equipment, it is expected that occasion may soon arise to transfer motive power from one road to another which has a special need for additional motive power facilities. The chairmen of the six department committees have been appointed a committee to study and report to the Executive Committee on the distribution of power as between railroads, and also on the adjustment of passenger train service in accordance with the national requirements and the situation in respect to present and prospective storage plants for government property in relation to railroad facilities and the prompt release of cars. Special committees have been appointed in each department to assemble data relating to the motive power in each territory.

The Executive Committee recently held a conference with a number of state railway commissioners and officers from the states of Iowa, Kansas, Minnesota, Nebraska, South Dakota and Washington, who were in Washington in connection with the rate advance case. Chairman Harrison explained to them the reasons for the formation of the special committee and outlined the action it had taken so far, asking for the cordial co-operation of the various state commissions in the work which the railroads have undertaken for the purpose of securing the greatest efficiency in the use of railway facilities. The state commissioners responded that the committee could be assured of their support.

A special meeting of the executive committee of the National Industrial Traffic League has been called to be held in Washington on Friday of this week for the purpose of considering transportation problems which have arisen as a result of the war, with special reference to co-operation on the part of the shippers toward increasing efficiency in the use of freight cars. The meeting was called in pursuance of a request from the railroad executive committee for co-operative action on the part of the league and Fairfax Harrison, chairman of the committee, has been invited to be present to explain the purposes of the carriers and ways in which shippers can co-operate.

Pooling Lake Coal Shipments

Chairman Harrison, of the executive committee, has issued the following statement in explanation of the plan for pooling lake coal shipments which was reported briefly in last week's issue:

"As part of the efforts being made in all directions to increase the capacity of the existing railroad facilities of the country, that they may better meet the present national emergency, arrangements have been made by shippers and railroads whereby all coal for shipment on the Great Lakes through Lake Erie ports will be 'pooled.' It is expected that this will effect such a saving in the time of freight cars that it will be practically equivalent to adding 52,000 cars to the available freight equipment of the railroads.

"The practice heretofore has been for each individual shipper to send his coal to some Lake Erie port, and there gradually accumulate enough for a full shipload. In the meantime the cars were held up, and, due to the numerous grades of coal handled in this way, much switching was necessary; under the 'pooling' arrangement coal owned by different producers will on arrival at a lake port be put in a common pool, and despatched to the northwest as fast as steamers are ready to take it. The pooling plan will necessitate a large reduction in the number of grades of coal handled. It is thought that the new arrangement will effect a saving of one and a half days in the time of each car that carries coal to Lake Erie ports.

'It is estimated that the railroads will haul 26,000,000 tons of coal to the lakes for trans-shipment to the northwest during the 180 days of the navigable season, and that 36,000,000 tons of ore will be moved in the same time from Lake Erie ports to inland furnaces."

YOUR FIRST PATRIOTIC DUTY—BUY A LIBERTY BOND

A number of important railroads throughout the country have joined heartily in the campaign to make the Liberty Loan the success that it deserves to be. They are subscribing for large blocks of the bonds themselves, and several of them have announced plans whereby any and all of their employees can subscribe for bonds and pay for them on the installment plan.

Union Pacific

Chairman R. S. Lovett of the Union Pacific in his memorandum to all officers, agents and employees of the Union Pacific System last week announced the plan of that road to be as follows:

"I trust that every man and woman in our organization intends, as a patriotic duty, to subscribe to the 3½ per cent Liberty Loan bonds about to be issued by the Government to carry on the war. The loan must be made a conspicuous success; and to enable every employee to participate in this patriotic purpose the company will, upon the request of any such employee, make subscription for his or her account to an amount of bonds not exceeding 25 per cent of the employee's yearly salary, and will advance the whole subscription price, charging interest thereon at the rate of 3½ per cent per annum, being the same rate borne by the bonds, and holding the bonds as security for its reimbursement. The amount advanced by the company will be payable by the employee in monthly installments of 10 per cent of the monthly wages of such employee, so long as in the service, with a minimum of $5 per month, such installments to be deducted from the wage payments. It is earnestly hoped that employees will not limit their subscriptions to merely the amount advanced by the company, but in addition will subscribe to the extent of any funds they may have available. The Union Pacific has itself subscribed for $5,000,000 of these bonds."

Texas & Pacific

"Of the company's 10,000 employees," says the announcement of the receivers of the Texas & Pacific to that road's officers and employees, "at least half of us can, and therefore, are obligated to subscribe to this loan."

The company has made arrangements with a bank in New Orleans whereby an employee can subscribe for a bond by the payment of 10 per cent down and the balance in nine months installments of 10 per cent each, to be deducted from the pay roll. The bank will credit to the employee's account interest at 3 per cent on the payments made and will deliver the bond through the road's assistant treasurer when payment has been completed.

Erie

Under the direction of President F. D. Underwood, the officers and employees of the Erie are organizing a lively campaign whereby they hope to sell a large block of the bonds. Before announcing definitely the plan that would be followed, President Underwood issued a statement to the employees in which he said:

"It should be, and I hope is, the desire of Erie employees to do what they can at this time for the defense of our country by helping to strike a blow in the battle for its rights.

"The bonds are recommended to you as an investment for two reasons: First, their utter stability. They are as good as gold; that fact cannot be upset. Second, they are free from taxes of all kinds, except estate or inheritance tax, and while the interest may be less in gross amount than that on a bank deposit, a mortgage or a note, in the end they are a better paying investment owing to their freedom from taxation.

"Taking these facts into consideration, it is hoped you will invest in them to the fullest extent possible."

Pennsylvania

The Pennsylvania Railroad has entered into an arrangement with the Mutual Beneficial Association of its employees, which will enable all men and women in the service to become subscribers, and on easy terms, if they so desire. The object is to mobilize, at once, the buying power represented by the army of 150,000 men and women employed by the company and its affiliated eastern lines. Circulars describing the loan, stating its object and urging co-operation in making it a success, will be placed in the hands of every employee.

Subscriptions may be made, without expense, through the Mutual Beneficial Association by any employee, whether a member of the Association or not. Bonds will be issued in denominations of $50, $100, $500 and $1,000, and will pay 3½ per cent interest. Employees desiring to avail themselves of easy payments may purchase the $50 bonds for $10 down and $10 a month until paid for. Bonds of the higher denominations may be bought on the installment plan on equivalent terms.

Employees who so desire may have the monthly installments deducted from their wages, or, if they prefer, they can forward the remittances themselves, directly to the Association. No commission or brokerage of any kind will be charged for the purchase of any bonds either bought outright, or on the installment plan.

Warren S. Stone

Warren S. Stone, Grand Chief of the Brotherhood of Locomotive Engineers and a member of the labor committee of the Council of National Defense, believes the railroads of the country ought to make every effort to assist railroad employees in subscribing for the Liberty Loan.

"More than a million and a half men are employed in the transportation industry," says Mr. Stone, "and their wage earnings are close to $1,500,000,000 a year, or $4,000,000 a day. The mere statement of these wage figures shows at once what an opportunity presents itself to enlist the savings of railroad workers in the defense of liberty and democracy.

"I believe that the cost of the war ought to be met largely from our future production and earnings, rather than from our saved-up capital from the past. The economists tell us that the annual earnings of all the people of this country are close to fifty billion dollars a year. This means that every two weeks we produce the $2,000,000,000 needed for the first Liberty Loan. The wage-earners of the nation have very little saved-up capital that they can lend the government. Their savings are in their homes and their insurance and a little nest egg for a rainy day. But they can lay aside a part of their future wages, week by week, and month by month, to buy government bonds.

"Railroad workers, and especially the men in the train service, are keen to do their bit for the common cause. If the railroad companies will provide the machinery of payment I know that our men will provide the money."

Progress of the Ambato-Curaray Railway.—Considerable progress was made on the construction of the Ambato-Curaray Railway, in Ecuador, up to March 1, 1917, 563 people being employed. During the past two months several bridges and culverts have been completed, 24,053 cubic yards of material handled, and 18.64 miles of terraplane finished, nearly to the city of Pelileo, and rails laid, at a total expense of $6,916. Two trains each week are now being operated over most of the line, which serve as work trains, and carry passengers and freight. The construction work is under the direction of American engineers, the imported material being wholly from the United States.

Federal Trade Commission Report on Coal

Careful and Detailed Report on Present Conditions in Bituminous Coal Trade and Remedies Proposed

THE Federal Trade Commission on Saturday, May 19, sent to the House of Representatives a preliminary report on the bituminous coal situation. The report confines itself to present conditions. A more detailed report embodying the full results of the commission's inquiry into the industry will be made later. The report is especially interesting to railroads because the increased price of coal has been the largest item in their increased operating expenses.

The commission has recently held in Washington and Chicago public hearings at which representatives of mine operators from the different coal fields, the railroads, municipal public utilities and industrial consumers appeared and furnished specific information. The commission finds that while the productive capacity of the present mines has been ample, the railroads, from a variety of causes, have not furnished sufficient cars to carry the coal to points of consumption, but it explains the difficulties that have confronted the roads. The report says in part:

There is no scarcity of coal in the ground. There is sufficient coal available in the bituminous coal mines now being operated not only to supply the present demand, but also to supply a greatly increased demand. At present, however, there is a shortage of bituminous coal at the points of consumption. The unprecedented demands for this fuel during the past six months, together with the difficulties of rail and of water transportation (particularly by water to the markets of New England, the Great Lakes region, and along the Ohio river), have not only absorbed the coal as fast as it could be shipped from the mines, but have also led to almost complete exhaustion of the coal stored at tidewater points, and at the docks on the Great Lakes.

In the face of a probably greatly increased demand for bituminous coal on the part of the government for military purposes, for increased transportation, for the manufacture of munitions of every description, and for many other forms of industry, the necessity of mining and distributing more bituminous coal than ever before, both to supply current needs and to replenish exhausted storage, is obvious. The country faces a serious state of affairs in obtaining a commodity which is basic to practically every form of its military and industrial activities. Several of the other belligerent countries have had to meet this same problem, and finding their coal supply seriously endangered they have taken far-reaching governmental action to safeguard it. In England the government took complete control of the coal mines after less radical methods of regulation failed. The French government has drawn up a scheme for dividing France into three coal zones in order to equalize distribution, and the government becomes the sole vender. On May 2, 1917, the Russian provisional government took over all the coal mines of that country with a view to control coal distribution and prices. Soon after the outbreak of the war, Germany took measures to centralize the whole coal industry of the Empire under government control. The Italian government imports all the coal brought into the country and acts as a clearing house for its distribution.

Causes of the Present Situation

(1) *Increased demand.*—The marked increase in demand began to be felt about six months ago. In 1916 the shipments of bituminous coal from the mines amounted to about 509,000,000 tons, or about 66,000,000 tons more than in 1915, when previous records in production had been surpassed. Nevertheless, the demand has recently increased to such an extent that not only the unprecedented output of 1916 has been consumed, but stored coal accumulated from the production of previous years has also been practically exhausted. For example, on the docks of Duluth and Superior there have usually been carried over, at the opening of navigation, some 3,000,000 tons, but this year when navigation opened the docks were practically empty.

(2) *Shifting of markets.*—Much of the increase in demand was concentrated in certain localities. There were transportation difficulties due to unprecedented burdens laid by all classes of freight on both rail and water transportation facilities. All this led to a considerable shift to other sources of supply in the markets usually supplied from certain coal fields. For example, coal mined in western Pennsylvania, eastern Ohio and West Virginia did not reach the markets of the Great Lakes and the lower Ohio in the usual quantities. This was because of increased demand from nearer markets, car shortage, decreased lake transportation facilities, low water for a considerable period on the Ohio river, and floods in the West Virginia mining region. Consequently the Indiana-Illinois fields have been drawn on to supply the deficit. Thus, the tonnage in commercial shipments, (i. e. coal not for use of railroads) sent to Michigan from the mines of the Illinois-Indiana fields is reported to have been over 17 times as great during the nine months from April to December, 1916, as it was during the entire year preceding.

One of the important results of this shifting of markets was a buyers' panic, due to the uncertainty of consumers with regard to getting coal from their regular sources of supply. This led in many cases to a frantic bidding of buyers against each other for that proportion of the coal supply (usually known as "spot" or "free" coal) which the mine operators were able to produce and ship in addition to the part of their output sold under contract.

(3) *Inadequate transportation facilities.*—While, as previously pointed out, there is no lack of coal in the ground, or of mines from which it can be obtained, the fact must be borne in mind that few soft coal mines are equipped to store coal. The coal must be loaded into railroad cars as fast as it comes out of the mine. As a general rule, miners do not go into the mine unless the cars necessary to take care of the day's output are on hand at the mouth of the mine. Cars enough to carry away the coal as fast as it can be mined are therefore a prime necessity. During the past six months from a variety of causes the railroads have not furnished, or have not been able to furnish cars equal to the productive capacity of the mines. Furthermore, where coal has to be carried part of the way by water, there has been difficulty in getting enough boats.

The principal causes for a lack of adequate rail transportation have been: car shortage, embargoes on the movement of freight cars, lack of sufficient motive power, and, to some extent, abuse by shippers and consignees of reconsignment and demurrage privileges. Car shortage in some cases appears to have been due to lack of sufficient cars suited to carrying coal, in others, to the diversion to use in other industries of cars generally available for the movement of coal and in others to the much longer hauls required, due to the shift of markets from their normal sources of supply, which required more cars than usual to distribute the same tonnage. Lack of terminal facilities adequate to handle the immense volume of freight consigned to certain points resulted in great congestion at those localities. Railroads on whose lines the

shipments originated had to place embargoes against shipments consigned to such destinations, until the congestion could be relieved. In some cases there was also a lack of sufficient locomotives to move the coal from the mines to the consumer. Some of the car shortage appears also to have been due to abuses by shippers of reconsignment privileges, and of consignees of demurrage privileges in the unloading of cars at destination. In some instances such reconsignment and demurrage privileges appear to have been used by mine operators and brokers as temporary storage in connection with speculative activities to obtain extortionate prices from coal consumers.

The principal causes for a lack of adequate water transportation have been:—diversion of boats in the coastwise coal trade to other lines of ocean traffic; diversion of boats in the lake coal trade to ocean traffic; and the conflict of the demand for iron ore and grain transportation with the demand for coal transportation. This conflict has occurred because of the higher freights paid for eastward bound iron ore and grain transportation than for westward bound coal. The delay incident to loading and unloading coal, and the fact that three of the highly profitable grain or ore cargoes could be transported in the same time in which only two could be carried, if coal were taken westward, has resulted in boats suitable for carrying coal going westward empty, using water as ballast instead of coal.

(4) *Labor conditions.*—Statements made at the commission's hearings by mine operators from different coal fields, indicate that in some regions there has been and still is an actual shortage of mining labor.

(5) *Increased costs of production and distribution.*—Considerable information in regard to increases in costs of production and distribution was submitted by coal operators at the commission's hearings, or has been gathered directly by the commission's agents. These increased costs, as far as production is concerned, are comprised chiefly in cost of labor. While there has been a great increase in the prices of supplies, the increase in the cost of supplies per ton of coal has been a much less important factor than is generally claimed. In the distribution there has also been some increase in cost, mainly in increased cost of transportation to the point of consumption.

The figures already submitted to the commission in regard to costs and to prices at the mine, show that most of the present prices now being charged both on "free" coal, and on such few new contracts as the mine operators are entering into, are far in excess of the costs as shown by the operators' books.

Many of the operators frankly take the position that they are trying to get for their coal the highest price possible under the present demand, and are refraining, even at prices greatly increased over last year, from contracting their output to the extent of their usual custom. They defend this action by claiming that under the operations of the law of supply and demand they have for many years past been getting little more for their coal than the bare cost of production; that the mining of bituminous coal during that period has been a most unprofitable industry; and that this is their chance to recoup themselves for the losses of several years. Accordingly, they are demanding prices at the mine today which run from 50 per cent to several hundred per cent over the cost of their output.

(6) *Lack of sufficient storage facilities.*—The most economical way of handling coal is by loading it into cars as it comes from the mine, transporting it to the point of consumption, and delivering it in the same car direct to the retailer or large consumer. At times, there are adequate transportation facilities to keep the coal moving steadily in this way. But the consumption of bituminous coal is largely influenced by seasonal changes, the demand normally being heavy in fall and winter months, and lighter in the spring and summer. This leads, in normal years, to frequent shutting down of mines, because of lack of orders, at a time when there are plenty of coal cars, and conversely to traffic difficulties at other times, largely due to inability to secure enough cars to care for the current demands. The obvious remedy for such a state of affairs is the establishment of storage facilities, preferably near the centers of consumption. But the relatively great expense of storing coal has prohibited any general establishment of adequate storage facilities.

(7) *Speculative activities of some mine operators and brokers.*—From 70 to 80 per cent of the output of the bituminous coal is sold under contract by the mine operators. It is estimated that the railroads of the country consume about one-third of the total production of bituminous coal. Practically all of the railroad supply, in normal times, is under contract. Of the "free" coal produced by the mines, probably about half is sold by them direct to the consumer. The remainder of the "free" coal, and a small part of the coal sold under contract, reaches the ultimate consumer through the medium of middlemen, such as brokers and retailers. Charges of extortionate prices on the part of mine operators and brokers have been brought to the attention of the commission. According to some informants, various mine operators and brokers, through abuses of the reconsignment and demurrage privileges granted by railroads in order to facilitate the regular distribution of coal, have created or increased local shortages and extorted exorbitant prices from the consumers. These charges are now under investigation by the commission.

Suggested Remedies

The remedies which may be suggested for the present scarcity and high prices of bituminous coal, relate to its production, transportation, and distribution. The most effective remedies deal with improvement in the present facilities for transportation. Many operators asserted that such remedies were the only ones necessary. On the other hand, the representatives of the railroads, municipal public utilities, and industrial consumers, while admitting the importance of such improvement, pointed out that there were other conditions which need remedy.

(1) *Improvement of transportation facilities.*—At the hearings of the commission, the fact was brought out that measures are being taken by the Interstate Commerce Commission and by the Council of National Defense which it is hoped will relieve transportation conditions. For railroad carriers, additional regulations are being considered covering the distribution of open-top cars to the coal industry, the expediting of the movement of cars loaded with coal, and the return of the empty cars to mines; prevention of the abuse by speculators of reconsignment and demurrage privileges, and the providing, where necessary, of additional equipment for use in transporting coal, both cars and locomotives, either by acquiring new equipment, or through possible changes in other lines of traffic, such as dispensing with passenger trains which are not absolutely necessary and thereby releasing more locomotives for freight service.

For water carriers, remedies should be sought along the lines of requiring boats, suitable for coal carrying on the Great Lakes, to transport coal westward, instead of going back in ballast for grain and ore cargoes, and in adjusting the rail conditions so that there will be sufficient transportation facilities to carry the coal from the western Pennsylvania, eastern Ohio and West Virginia mines to the loading docks on Lake Erie, for prompt loading of the boats. The limited period that the lakes are open to navigation makes it necessary that the carrying capacity of the boats be kept in continuous use. Early remedial action is necessary because every week of the navigation season is of tremendous importance in preventing shortage of coal in the Northwest next winter.

The principal remedy suggested for conditions in the coastwise water transportation of coal, apart from the building of more boats, is the exemption from military use of tugs and barges absolutely necessary to transport not only the coal, but also the timber needed for mine use.

(2) *Improvement of labor conditions.*—It was developed at the hearings on the part of the operators that they anticipated that labor conditions in 1917 would permit, if mining operations could be kept steady by a continuous supply of cars, the production of as much coal as that mined in 1916, and some of them stated that with their present force they could mine an excess of from 15 to 20 per cent over their output in 1916. If this statement is accurate, the operators in the coming year will supply more bituminous coal than in 1916.

It will probably be found necessary to exempt miners from the conscription law, so long as they remain at work in the mines. The experience of Great Britain in this matter should be heeded, and the disastrous results which came from the enlistment of miners avoided. Everything should be done to encourage men employed in the coal mines to stay on their jobs.

(3) *Establishment of increased storage facilities.*—It is highly desirable that additional storage facilities be provided at points of consumption. Municipal and other public and semi-public utilities and institutions should safeguard themselves, not only against being shut down but also against being forced by their urgent necessities to buy coal at exorbitant prices. The railroads, which consume about one-third of the bituminous coal mined, should increase their storage facilities and avoid the necessity of holding cars loaded with coal for railroad use.

(4) *Regulations by governmental authority for the distribution of coal.*—Under war-time conditions it may become the duty of the government of the United States to take steps similar to those found necessary by the belligerent European countries, and not only regulate the distribution of the coal from the mouth of the mine to the ultimate consumer by allotting the quantity of the product which the different classes of consumers shall be allowed to purchase, but also to establish the prices to be paid by different classes of customers. Any prices thus established would probably have to be based on actual costs, with an allowance for a reasonable return on actual investment. In other words, the price of bituminous coal, which is a great public necessity, should be fixed according to the same general principle which has been established in the conduct of public utilities. At a time like the present, excessive profits should not be permitted to be extorted from the public by producers and distributors of any prime necessity of life.

The commission has sent also agents into different parts of the country who will observe closely throughout the anthracite trade the operation of plans formulated at recent conferences of the commission with operators, jobbers and representative retailers for bringing prices down to moderate levels and keeping them there.

These field agents will report promptly to the commission for appropriate action any renewal of the intolerable abuses that marked the activities of certain elements in the trade during recent months.

The independent operators have realized that the situation calls for public-spirited action on their part, and it is expected that they will reduce their present prices to moderate levels for the season and co-operate in every way with the commission.

MORE AMERICAN LOCOMOTIVES FOR CHINA.—Twenty more railway locomotives of American make have arrived in Wuchang for use on Chinese railways. Ten of these are already in use on the Wuchang-Changsha railway, and the other ten are to be put on the Peking-Hankow line.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., May 22, 1917.

BILLS TO CREATE AUTHORITY OVER PRIORITY OF FREIGHT SHIPMENTS.

New bills to give the President of the United States power to direct that certain kinds of traffic or particular shipments shall have preference or priority in transportation during the war were introduced in Congress on May 16 by Senator Newlands, chairman of the Senate Committee on Interstate Commerce, and Representative Adamson, chairman of the House Committee on Interstate and Foreign Commerce and the House bill was reported favorably by the committee on Monday. The new bills were introduced immediately following a conference with the President by Senator Newlands and Representative Adamson, as a substitute for the Webb joint resolution introduced on the preceding day, as reported in last week's issue, and while the purpose is the same several of the provisions are changed. The Webb resolution provided that the President may direct the exercise of the powers conferred by any department or agency of the government or by any person whom the President may appoint as commissioner, or by any persons, not to exceed five, whom he may appoint as a commission of transportation. The new bills, S. 2293 and H. R. 4467, which are identical, provide that the President may issue orders "direct or through such person or persons as he may designate for the purpose to any of the officers, agencies or employees of the aforesaid carrier companies." Officials of the United States when so designated shall receive no compensation for their services. Persons not in the employ of the United States so designated shall receive such compensation as the President may fix. It is also provided that suitable offices may be rented and all necessary expenses shall be paid as directed by the President.

The fact that the Webb resolution authorized the appointment of a commission of transportation of five members gave rise to the inference that it might be the purpose to delegate the powers conferred to the Executive Committee of the American Railway Association Special Committee on National Defense. The language of the Newlands and Adamson bills seems to contemplate the appointment of a new governmental commission, or priority board, upon which would be imposed the duty of deciding which of the many claims for priority in transportation should have the preference, leaving to the railroad committee the machinery for giving priority to the shipments thus determined to be the most urgent. The railroad War Board began its work by issuing orders to the railroads to give preference to the transportation of coal and iron ore and announced that similar orders might be issued later as to other commodities. Representatives of various industries have appeared before the Car Service Commission and presented various reasons why special consideration should be given to their shipments in the public interest and a great many questions as to what kind of traffic should have preference have thus been raised. Railroads are required by law to give preference to all freight for the government and have naturally been doing so, but when various departments of the government have asked for priority at the same time for different kinds of traffic it became necessary for the railroads to suggest that some central authority be created to decide such questions.

The new bills also contain a provision which was not in the Webb bill, that it "shall be the duty of any and all such officers, agents or employees of such carriers by railroad or water to obey strictly and conform promptly to such orders, and failure to comply therewith or to do or perform whatever is necessary to the prompt execution of such order, shall render such officers, agents or employees guilty of a misdemeanor and any such officer, agent or employee shall upon conviction be fined not more than $10,000, or imprisoned not

more than five years, or both, in the discretion of the court."

Recognition of the fact that the delegation of authority to direct the operation of the railroads as a system during the war entirely ignores the existence of the Sherman Anti-Trust law, which made it the policy of the government to force the kind of competition between railroads which war has made it necessary to eliminate, is shown in the concluding provision of the bills, that any carrier complying with any such order of the President provided for in the bills "shall be exempt from any and all provisions in existing law imposing civil or criminal pains, penalties or liabilities upon carriers on account of any such action." This provision is also an indication that various other laws which have restricted the operations of carriers may have to give way during the war.

Another paragraph of the Newlands and Adamson bills not in the Webb resolution provides that "when, in accordance with such order hereinbefore provided any of the said carrier lines shall, for the benefit of the United States, perform any particular service so ordered, the compensation due for such service shall be fixed by the Interstate Commerce Commission."

Some time ago bills were introduced both in the House and in the Senate authorizing the President to take over railroads, telegraph or telephone lines for military purposes and to draft their officers and employees into the service of the government. The action of the railroads in delegating complete authority to a central committee of railroad executives at Washington is apparently recognized as having made such bills unnecessary because both Senator Newlands and Representative Adamson have transferred to their new bills regarding the priority of shipments a provision which had been included in the other bills, to authorize the President whenever, in his judgment, the public interest requires to employ the armed forces of the United States to prevent any obstruction or retardation of the passage of the mail or of the orderly conduct or movement of interstate or foreign commerce. The President already has authority, under the army appropriation law of 1916, to take possession of any system of transportation for military purposes and to utilize it to the exclusion of all other traffic, if necessary.

Attorney General Gregory, who drafted the Webb resolution proposed by the President, issued a statement explaining the need for such legislation, as follows:

"As war conditions develop it is certain there will be times when the shipment of arms and ammunition may be of prime importance; at another time the movement of provisions may be more important; at another, the movement of coal and iron ore may become the most important of all.

"Under these conditions it is thought essential that the power should be fixed in the President to determine from time to time what particular freight shall have priority and for how long this priority should continue. The powers conferred are to exist only during the war. In carrying out these powers it is proposed that the President be authorized to utilize any existing department or agency of the government, or to appoint for this purpose a commissioner or a commission, not exceeding five in number."

Senate Would Require Suspension of Increased Rates

The Senate on Tuesday passed the bill to increase the membership of the Interstate Commerce Commission from seven to nine and authorizing it to organize itself into divisions with power to act for the commission. The Senate also adopted an amendment to the bill proposed by Senator Hoke Smith of Georgia, which, if the bill becomes a law, would make it mandatory on the Interstate Commerce Commission to suspend the proposed increase in freight rates pending its investigation of the reasonableness of the advance. A bill providing for the reorganization of the commission was passed by the House at the last session and has been favorably reported by the committee on interstate and foreign commerce at this session. The Smith amendment strikes out the provision of the present commerce law, in section 15, which authorizes the commission to enter upon a hearing concerning the propriety of an increased rate and says that it *may* suspend its operation for 120 days, and provides that on complaint or protest the commission *shall* enter upon a hearing and *shall* suspend the rate pending the hearing and decision thereon and until "after the commission has found and declared the same to be just and unreasonable, neither unjustly discriminatory nor unduly preferential or prejudicial nor otherwise in violation of the provisions of this act."

Car Supply

A bill similar to the Esch bill, recently passed by the House of Representatives to give the Interstate Commerce Commission jurisdiction over car distribution and interchange was passed by the Senate on Tuesday, after consideration by a sub-committee of which Senator Pomerene is chairman, with some amendments which will require further consideration before it becomes a law. The powers given the commission under the Pomerene bill are broader than those conferred by the Esch bill.

Senator Smith of Georgia made an effort in the Senate on Saturday, May 19, to secure favorable consideration of his amendment to the army and navy appropriation bill, to provide that of the $750,000,000 for the purchase of ships $100,000,000 shall be used for the purchase of freight cars to be used by railroad companies under such terms and for such compensation as may be approved by the President.

The easy way in which Senator Smith calculates that the railroads do not need an increase in freight rates is illustrated by his statement that the present car shortage amounts to about 100,000 cars and that he proposed to buy that many for $100,000,000. In the course of the debate no one informed him that at present prices $100,000,000 would buy only about half that many cars. Senator Smith said he was trying to make the proposed 15 per cent increase in freight rates unnecessary, thereby saving the people three or four hundred million dollars a year, by having the government pay for the freight cars now and get its money back later with interest. The arithmetic of the proposition seemed to appeal strongly to several senators who thought it would be much cheaper for somebody to pay one hundred millions than to have freight rates advanced three or four hundred millions, but no one asked how the roads would meet the increase in their expenses which is their reason for asking the higher rates.

Senator Smith filled several pages of the Congressional Record with tables showing the earnings of the railroads in 1916 as an argument against raising freight rates in 1917. He disclaimed "the slightest approach toward advocacy of government ownership," but thought if the railroads could be furnished with a few more cars they would have no further excuse for asking higher rates. Senator Robinson argued that his proposal was nothing less than a step toward government ownership, a subject which is now being considered by a congressional committee, and as such should be debated at the proper time, not in connection with an emergency appropriation bill. Senator Smith's suggestion that a shortage of freight cars is the principal difficulty under which the country labors seemed to strike a responsive chord and evoked many speeches, although several senators thought the problem was one of distribution and that a few rules by the Interstate Commerce Commission would suffice to remedy the trouble, but the idea that the government should buy the cars received little sympathy and the senator was finally persuaded to refer his amendment to the Committee on Interstate Commerce.

War Tax on Freight and Express

The proposed war tax of 3 per cent on freight bills and of 10 per cent on express bills was made the subject of attack

in the House on Saturday and the express tax was reduced to 6 per cent, on the ground that no tax was imposed on the competitive parcel post shipments, by an amendment offered by Representative Mann. Representative Mondell proposed striking out the provision for the tax on freight and Representative Sabath tried to have it changed so that it would be paid by the railroad providing the service instead of by the receiver of the service, but both were rejected without division. Several members objected to the tax on shippers, estimated at $77,000,000 a year, in addition to what they would have to pay if the Interstate Commerce Commission allows an increase in freight rates.

A New Scheme for Settling Labor Controversies

In response to a request of the special Senate committee investigating the recent street railroad strike in Washington, Secretary of Labor Wilson has submitted to the committee a proposed bill for the settlement of labor controversies affecting interstate transportation. The bill proposes a commission of nine members to be appointed by the President and confirmed by the Senate, three to be representatives of the employers, three of employees and three of the public, which would be given jurisdiction in all controversies that threaten to interrupt interstate transportation. It provides that all wage questions must be settled on the basis of an eight-hour day and that the commission may order extra pay for overtime. Appeal from the decisions of the commission to the district courts is provided with final appeal to the circuit court of appeals.

New Building for the Interstate Commerce Commission

The Interstate Commerce Commission expects to be located this summer or early in the fall in a fine new office building of its own at the southeast corner of Pennsylvania avenue and Eighteenth street, Washington. The building is now nearly completed and contracts have been let for its equipment. The commission now has very inadequate quarters, occupying two adjoining buildings at 1315 and 1317 F street, the American National Bank building and the Interstate building, while its divisions of valuation, statistics and safety are located in the Homer building and the division of locomotive boiler inspection in the Southern building. In the new building all of the departments of the commission will be located under one roof, which will be a great advantage, and the commission will have the entire building to itself and its 1,200 employees. The new Interstate Commerce Commission building has 11 floors and contains over 200,000 square feet of office space. On the top floor there will be a large hearing room of more than twice the capacity of the commission's present hearing room, which will not seat over 200 people. When the commission now holds a hearing which attracts more than that number of people it is necessary to engage space outside in one of the hotels. There will also be a smaller hearing room of approximately the same size as the hearing room in the old building. The new building is not owned by the government, but will be leased by the commission on a yearly basis with a ten-year option. The commission will administer the operation of the building itself and it can probably be safely predicted that it will not be necessary to shut down the elevator service next winter on account of a shortage of coal, as was done several times in the old building last winter.

In its annual reports for several years the commission has urged upon Congress that in the interests of economy and efficiency and proper protection for its valuable records, the commission should be authorized to enter into a lease arrangement covering a term of years for suitable quarters. Its present quarters are not only inadequate and inconvenient because of its departments being scattered through four buildings, but they do not provide proper protection for the valuable records, which include the annual reports of the carriers since the organization of the commission and a complete file of railroad tariffs, the only one in existence. The two buildings in which the main offices of the commission are now located do not make a good combination because in some cases there is no direct connection between the corresponding floors of the two buildings and in passing from one building to the other it is often necessary to go up one floor and down again, thus wasting a great many steps. There are no adequate facilities for keeping the numerous records. For example, tariffs are stored in various places from the basement to the roof and the older ones are practically inaccessible. The dockets are also kept in various places throughout the building. The present lack of facilities, therefore, prevents the greatest efficiency in the use of records by the commission's employees and interferes with their accessibility and does not afford them proper protection. In the new building tariffs and other records will be kept in the most up to date style cabinets and filing systems.

RAILROAD REGIMENTS FOR FRANCE

As noted elsewhere, the Railroads' War Board has issued instructions to the American railroads to take vigorous action to assist in the organization of the nine regiments of railway men for service in France. It is desired to send these men to France at the earliest possible moment.

The communication to the railway executives which was sent out Monday says in effect:

"The French railways are badly run down. They need more or less complete rehabilitation. France has no men who can be spared for this work. She wants all her men at the front.

"Before we can train men to go into the trenches we can supply France's railroad wants, and we can do it practically immediately. Any men we send over must be soldiers, so it will be necessary for the railroad forces to enter the army.

"We propose to make up five construction regiments of six companies each, to do this rehabilitation. Each regiment will have an engineer officer of the United States army as colonel and another officer from the army as adjutant. The other officers will be made up of railroad men, except that the commissary will be provided by the United States Army. The lieutenant-colonel will be a chief engineer of a railroad, or someone else of similar experience. The captains will be taken from the engineers of maintenance of way, the lieutenants from supervisors or roadmasters, and the non-commissioned officers from track and bridge foremen. The privates will be track laborers.

"The pressing need just now is for officers for these regiments. They will require 5 chief engineers, 30 engineers of maintenance of way, 90 supervisors or roadmasters, 60 track foremen, and 30 bridge foremen. Each company will have 150 track laborers and 14 bridge carpenters as privates.

"The next important requirement on the French railways is for shop forces. They are short of men to repair their locomotives. It is proposed to organize a shop regiment, to be made up the same way as the construction regiments, except that the lieutenant-colonel will be a superintendent of motive power, the captains will be master mechanics, the lieutenants will be shop foremen, and the non-commissioned officers gang foremen. The rest of the company will be made up of boilermakers, machinists, blacksmiths, and their helpers."

"Three operating regiments will be raised, with officers from superintendents, trainmasters, yardmasters, and others having to do with the actual operation of trains. The privates in this case will be taken from the train crews."

The War Board has requested the following railroad executive officers to act as railway advisors to the officers of the United States Army in charge of the organization of

the regiments: W. W. Atterbury, vice-president of the Pennsylvania Railroad, will advise with Col. H. D. Deakyne at Philadelphia, J. H. Hustis with Major W. P. Wooten at Boston, B. F. Bush, president of the Missouri Pacific, with Col. C. M. Townsend at St. Louis, William Sproule with Col. J. P. Cavanaugh at San Francisco, H. W. Miller, resident executive officer of the Southern, with Major J. S. Sewell at Atlanta, and L. F. Loree, president of the Delaware & Hudson with Col. C. H. McKinstry at New York.

The recruiting officers of the nine engineer regiments have been reporting good progress.

On Wednesday morning the First Regiment, that for the New York district, lacked only 200 men of its required 1061. Captain J. P. Hogan who is in charge of the recruiting has been quite pleased with the response to the call for enlistments, but he has had great difficulty in securing a sufficient number of cooks.

On Tuesday 165 men of the regiment went into camp at Fort Totten, Long Island, and had their first chance to show what they could do as engineers when they had to prepare the camp for occupancy. Company A is the first company of the First Regiment to go into camp, but it is expected that the other five companies will be on the ground within two weeks. They will be drilled at Fort Totten for about the next 10 days, after which the regiment will go to a newly leased government reservation at Great Neck.

The New York regiment is under the command of Lieutenant Colonel C. H. McKinstry and Lieutenant X. H. Price is adjutant. Its senior major is William Barclay Parsons, the public service engineer. Mr. Parsons has been active in the New York National Guard and has been chief of engineers with the rank of brigadier-general.

The Second Engineer Regiment will be organized in St. Louis and will be commanded by Colonel Curtis McD. Townsend with Captain C. L. Hall as adjutant.

The organization of the Chicago operating regiment, the Third Regiment, mention of which has been made in detail in previous issues of the *Railway Age Gazette,* is well under way. Up to date over 3,000 employees of the six railways which will each supply one company for the regiment, have sent in their applications for places in the companies, and more applications are being received daily. Over 1,100 employees on the Chicago, Rock Island & Pacific have offered their services, 950 on the Illinois Central, and 300 on the Chicago & North Western. Colonel Langford and Captain-adjutant Black, the regular army officers in charge of the regiment, have opened offices at 1101 Monadnock block, Chicago, and are examining applicants as expeditiously as possible.

Men from the New England railroads are to form the companies of the Fourth Reserve Regiment. Major W. P. Wooten is in command of this regiment with Lieutenant L. E. Atkins. Adjutant-major Wooten plans to form Companies A and B with men from the Boston & Maine. Company C will be made up of men from the Maine Central, Company D by the Boston & Albany, and Companies E and F by the New York, New Haven & Hartford.

The Fifth Regiment is to be made up of men from the Pittsburgh District. Lieutenant Colonel Edward Jadwin is its commanding officer and Captain R. F. B. Sommerville, adjutant.

The headquarters of the Sixth Regiment are at Detroit. This regiment will be under the command of Lieutenant Colonel Harry Burgess and Captain R. F. Fowler is adjutant. This regiment is to do maintenance work only. Colonel J. G. Warren of the United States Engineer Corps has been receiving enlistments in Buffalo for this regiment.

The Seventh Engineer Regiment at Atlanta is in command of Major John S. Sewell, engineer of the reserve corps and formerly a major in the regular service. Lieutenant C. P. Bullard is adjutant. In his appeal for enlistments Major Sewell has announced that the personnel of the regiment will be drawn from the territory east of the Mississippi and south of Kentucky and Virginia.

A branch office for enlistments will be opened at Birmingham, Ala.

The Eighth Regiment at San Francisco will be under the command of Lieutenant Colonel J. B. Cavanaugh with Lieutenant J. B. Cress as adjutant.

The Ninth Regiment, with headquarters at Philadelphia, will be a shop regiment and will be principally recruited from the railroads lying south of New York, north of Washington and east of Pittsburgh. Its commander is Lieutenant Colonel H. Deakyne, with Lieutenant W. F. Tomkins as adjutant. Lieutenant Colonel J. P. Jervey stationed at Norfolk has also received instructions to recruit men from that section.

The regiment, excluding officers, will be made up as follows: 450 erecting machinists, machine and vise hands; 175 boiler makers, flue handlers and cistern repairmen; 175 blacksmiths, springmakers and tool dressers; 50 pipe fitters and helpers; 50 cab builders and tender repairmen; 50 sheet iron workers, tin and coppersmiths; 25 car and locomotive painters; 25 electricians, stationary engineers and firemen.

A census has been taken of the shop men on the various railroads in the district in which this regiment is to be recruited and each railroad company has been asked to furnish a number of men proportionate to the total number of shopmen on its payrolls. Double the number required from each railroad will be asked to volunteer, thus allowing for fifty per cent of rejections for physical disability or other causes.

The Pennsylvania Railroad's proportion will be 636 volunteers to provide for a total of 318 actual selections. All men accepted will be regarded as on furlough from the service of the Pennsylvania Railroad and upon their return will be restored to their positions. The work of handling the recruiting on behalf of the railroads in the Eastern district designated has been assigned to James Milliken, special engineer, Pennsylvania Railroad, and formerly superintendent of motive power at Wilmington, Del. He will act not only for the Pennsylvania railroad, but for all of the others in the eastern district which have agreed to participate in the raising of this regiment.

By last Saturday night nearly half of the Ninth Regiment's quota had been obtained. Saturday was a big day, large numbers of railway employees coming in groups. One group of 95 from Camden and Jersey City and another of 100 from the shops at Trenton were put through the physical examination. It is planned to occupy the barracks of the Commercial Museum in Philadelphia.

OUR ARMY OF ENGINEERS.—The sending of an army of nine regiments of engineers and highly trained railway men to France will be of more practical value than the transporting of several times that number of troops inexperienced in the mode of warfare now being employed on the western front, and it should have equal psychological value. * * * The present aspects of the fighting especially call for civil engineers and experts in transportation problems. Under American supervision, marvels of quick railway building have already been accomplished. We suspect that American ingenuity had a part in facilitating the renewal of the allied offensive after Hindenburg began his strategical retreat. Americans have been famous for such things. It was during Sherman's march that a Confederate grumblingly obeyed orders to blow up a tunnel: "I'll blow it up," he said, "but it won't do any good. Old Sherman carries a lot of extra tunnels with him and he'll have one down within an hour after he arrives." It was during the same march that a private soldier in a well-worn uniform volunteered to repair a locomotive the retreating Confederates had purposely crippled. "I helped to make this engine," he explained.—*St. Louis Globe-Democrat.*

Railway Fuel Association Convention

An Account of Closing Sessions, Including Reports on Feed Water Heating and Graphic Daily Fuel Reports

THE report of the opening sessions of the ninth annual convention of the International Railway Fuel Association, which was held in Chicago last week, was given in the *Railway Age Gazette* of May 18, page 1053. The following is a report of the remaining sessions:

MR. MODERWELL'S ADDRESS

C. M. Moderwell, of the sub-committee on coal production of the Advisory Committee of the Council of National Defense, addressed the convention on the coal situation and the war, saying in part:

This war is absolutely an industrial game all the way through and there is nothing that needs organization, nothing that needs the business man's view point, as much as this war does. There is nobody doing any more towards the conducting of this war than you men who stay in your places and see that transportation is furnished. If there is anything we need in this country right now it is coal and transportation. They are interrelated. We cannot have transportation without coal, and, of course, you must have transportation for coal.

I will tell you of the problem that the coal production committee has to face. In the first place, there is a critical situation in New England. New England's coal supply, which amounts to about 20,000,000 tons, has been borne by water very largely. It comes from Newport News, Norfolk and Baltimore either by steamer or it is transported in barges hauled by seagoing tugs. The necessities of the government may be such that the government will take the tugs and steamers. The railroads to New England go through that narrow neck by way of Poughkeepsie, Albany and Troy from the Central Pennsylvania coal fields. They are absolutely blocked from one end to the other. You could not add another pound of freight to them if you wanted to. The consequence has been the price of coal in Central Pennsylvania has gone to $7 a ton at the mines, and the buyers in New England are putting it up every day. They cannot get the coal, no matter what they pay for it.

Another serious situation we have is in the neighborhood of Detroit, Mich. Detroit is in a constant state of blockade, probably due to the excessively large manufacturing interests. It is not a blockade of coal. It is a blockade of other commodities that prevent the coal from reaching Detroit.

Another serious situation is the far Northwest, including some parts of Western Canada. The railroads and the industries and the consumers in that country are in serious and dire distress, or, if not now, they will be when winter comes on. The coal for that country is supplied by Pennsylvania, West Virginia and Kentucky, taken by rail to Lake Erie ports, thence by water to Lake Superior and thence by rail to destination. But this year that production is not going to be adequate. We had a meeting in Washington with the railroads serving the coal fields to the lakes, with the vessel men, with the coal men and with the ore men, trying to work out the problem, and the best judgment of the combined body is that if we get 65 per cent of the coal on the docks when navigation closes this fall, we will be doing extremely well. That means that 8,000,000 or 10,000,000 tons of the coal that is necessary for the railroads and for the industries in that country must come from other fields, largely from Illinois and Indiana, where the transportation facilities and the coal mining properties are already overburdened and can hardly take care of the burden they are carrying now.

Secretary Lane told the committee in plain language that before winter comes America must assume the burden that England has carried of furnishing coal to Italy and France. Now, somewhere and somehow you have got to get the coal, you have got to get the vessels, you have got to get the cars, to transport the coal to keep those people from freezing. The present vessel rate to the Mediterranean ports is almost $40 a ton for carrying coal. So you can see what the situation is. England is struggling with it but is unable to do anything for them and has notified her allies that they must look elsewhere for coal during the coming year. It is a problem of production and transportation. Just how those two items can be brought to co-operate is something that I cannot say at the present time.

This war is a challenge to all of us. We have had 150 years of peace and of independence, and if we cannot out of that 150 years prove to the world that we are what we claim to be, and we have had the reputation of being, the greatest organizers in the world, then there is not very much hope for our country.

LOCOMOTIVE FEED WATER HEATING

The economy, expressed in percentage of fuel saving, to be derived from preheated as compared to non-preheated feed water is in direct ratio as the temperature difference of the water before and after heating is to the difference between the total heat of the saturated steam at a given pressure and the final temperature of the preheated feed water. This may be expressed in the formula

$$S = \frac{100\ (t - t_1)}{H + 32 - t_1}$$

S = The percentage of saving from preheat.
t = The temperature in degrees F. after preheating.
t_1 = The temperature of the feed water before heating.
H = The total B. t. u. above 32° F. of saturated steam at the given pressure.

To obtain the maximum theoretical saving from preheating, the water must be brought up to the temperature of the saturated steam. With t less than the temperature of the saturated steam, and both t and t_1 constant, the percentage of savings varies inversely with the boiler pressure, increasing as the temperature difference between steam and water decreases. Hence it follows that with other conditions remaining constant, the higher the initial temperature, the greater is the percentage of economy per degree rise of preheat. The theoretical fuel saving from preheating is shown in Fig. 1.

It should be remembered that the amount of heat passing through a metal sheet has a direct ratio to the temperature difference on the two sides of the sheet.

Preheat as Relating to Locomotive Operating Conditions

From an operating standpoint, feed water heating is a pre-requisite to the best performance and maximum locomotive efficiency. The introduction of comparatively cold water into the locomotive boiler reduces the effectiveness of the entire machine appreciably, especially on heavy grades, where almost invariably a drop in pressure results, often at a crucial moment when every pound the boiler can produce

is needed. The utilization of preheat permits a freer steaming boiler, confidence is instilled into the fireman and a better "job of firing" is obtained, with consequent increase in locomotive capacity.

It is evident that the earnings of a railroad are vitally affected by the efficiency of the motive power unit in reducing the cost of operating expenses and increasing the net operating revenues. Fig. 2 illustrates graphically the saving in dollars per annum per locomotive, at different rates of fuel consumption and varied cost of fuel per ton on engine tanks, in the use of preheated feed water.

Boiler Maintenance

One of the most favorable aspects of preheating is its effect upon boiler maintenance, although it would be difficult to establish any definite relation existing between higher feed water temperatures and the decreased cost of maintaining boilers. The effect of preheating is to lessen the difference between the temperature of feed water injected and the temperature of saturated steam evaporated. A more uniform temperature throughout the boiler, resulting from feed water heating, will effect a greater reduction in strains upon the various parts of the boiler than a considerable reduction in boiler pressure.

Heat Balance

That a clear understanding of the principles underlying the construction and operation of feed water heaters may be had, it is advisable to review, in some degree, the subject of heat and its source and distribution in a steam locomotive.

The unit for measuring heat is a British thermal unit

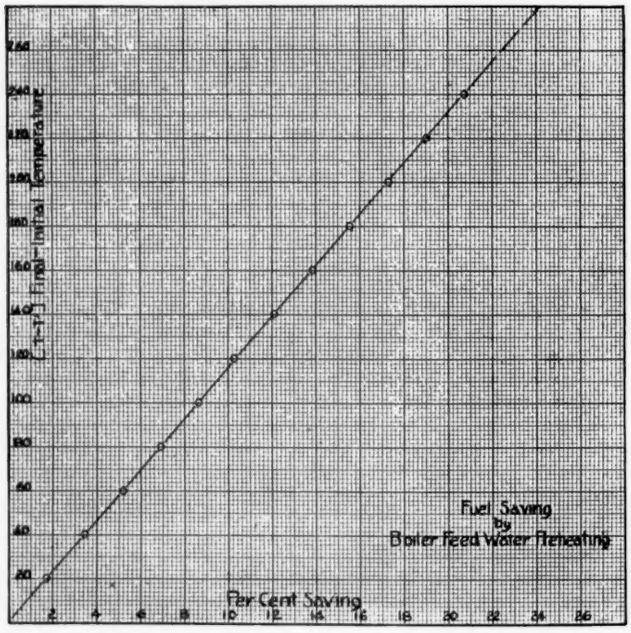


Fig. 1—Percentage of Fuel Saving by Feed Water Heating

(B. t. u.). A B. t. u. is defined as 1-180 of the amount of heat required to raise the temperature of one pound of pure water from 32 deg. to 212 deg. F.

A pound of locomotive coal usually contains between 10,000 and 14,000 B. t. u. The distribution of this heat after it is liberated from the coal varies widely under different conditions. There is, consequently, a broad range of proportions of heat distribution from which to select an example for discussion.

Choosing one which will fairly represent attainable everyday practice on a properly proportioned locomotive of fairly large size and equipped with a superheater and brick arch, we find that 14,000 B. t. u. in each pound of coal could be distributed about as follows:

Lost to ash pan in unconsumed coal and heat in ashes		280 B. t. u.
Absorbed by firebox heating surface	3,780 B. t. u.	
Absorbed through boiler tubes	5,810 B. t. u.	
Total to water	9,590 B. t. u.	
Absorbed by steam in superheating	1,050 B. t. u.	
Total in steam		10,640 B. t. u.
Lost out of stack in hot gases, cinders, water vapor from moisture in coal and in incomplete combustion of gases		3,080 B. t. u.
Total		14,000 B. t. u.

It is seen that 10,640 B. t. u. or 76 per cent of the total goes into the steam. This is the boiler efficiency. It will vary from less than 40 per cent to as high as 80 per cent in a reasonably clean boiler. Within the range of ordinary locomotive operation higher efficiencies accompany the lower rates of coal consumption per hour.

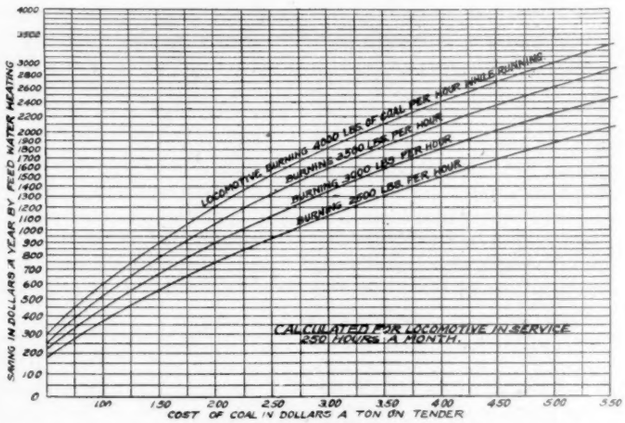

SAVING IN DOLLARS A YEAR BY FEED WATER HEATING
LOCOMOTIVE BURNING 4000 LBS. OF COAL PER HOUR WHILE RUNNING
BURNING 3540 LBS. PER HOUR
BURNING 3000 LBS. PER HOUR
BURNING 2500 LBS. PER HOUR
CALCULATED FOR LOCOMOTIVE IN SERVICE 250 HOURS A MONTH.
COST OF COAL IN DOLLARS A TON ON TENDER

Fig. 2—Amount of Money to Be Saved Yearly by Feed Water Heating

Investigating the distribution of this heat further, it will be found that the B. t. u. in the steam may be split up as follows:

To the drawbar to pull trains	980 B. t. u.
Used in friction of the locomotive	140 B. t. u.
Radiated from the whole locomotive (this includes radiation from the fuel bed)	420 B. t. u.
Used by the air pump (assumed)	840 B. t. u.
Discharged up the stack in the exhaust steam	8,260 B. t. u.
	10,640 B. t. u.

From these two tables it will be seen that 11,310 B. t. u. of the 14,000 B. t. u. in the coal, or 81 per cent, may go up the stack in form of hot gases, cinders, etc., and in the exhaust steam.

Sources of Preheat

From the foregoing it is readily seen that the source of preheat is exhaust steam and waste gases, the potential energy of which must be utilized, at least in part, for preheating if useful work is to be obtained therefrom.

Exhaust Steam.—In exhaust steam there seems to be the greatest waste. Most of it, however, is unavoidable, a large part of the exhaust being essential to produce the draft required for rapid rate of combustion in the firebox.

Consider first what happens when heat is applied to water. For example, take a boiler under a pressure of 200 lb., and feed water at 60 deg. temperature. The first effect is to raise the temperature of the water from 60 deg. to 388 deg., which is the boiling point of water under 200 lb. pressure. For a pound of water this will require, roughly, 388—60 or 328 B. t. u. (accurately, 333.4 B. t. u.). It is now at the boiling point, but none of it has actually been changed into steam. Continue the addition of heat, and it will gradually evaporate into steam, and when 837.9 B. t. u. have been added the original pound of water is all steam,

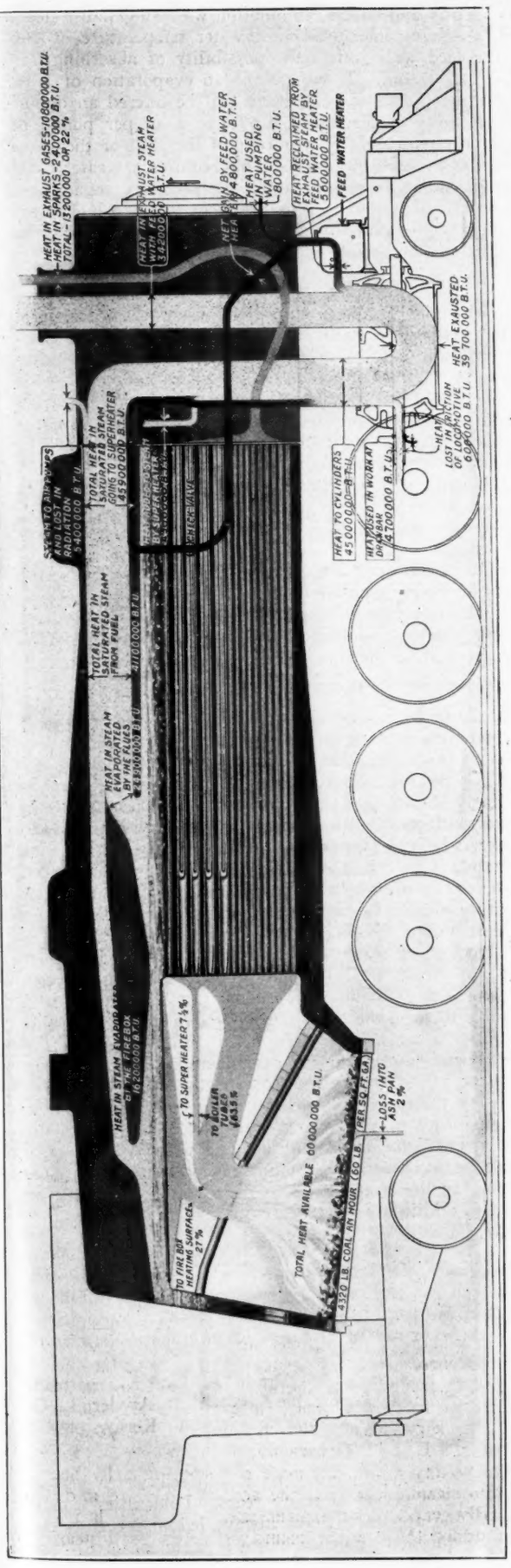

HEAT IN EXHAUST GASES-10800000 B.T.U.
HEAT IN SPARKS-2400000 B.T.U.
TOTAL-13200000 OR 22 %
HEAT IN EXHAUST STEAM WITH FEED WATER HEATER 3420000 B.T.U.
NET GAIN BY FEED WATER HEATER 4800000 B.T.U.
HEAT USED IN PUMPING WATER 600000 B.T.U.
HEAT RECLAIMED FROM EXHAUST STEAM BY FEED WATER HEATER 5600000 B.T.U.
FEED WATER HEATER
HEAT EXHAUSTED 39 700 000 B.T.U.
HEAT RADIATION OF LOCOMOTIVE 6000000 B.T.U.
HEAT USED IN WORK AT DRAWBAR 4700000 B.T.U.
HEAT TO CYLINDERS 45000000=B.T.U.
TOTAL HEAT IN SATURATED STEAM GOING TO SUPERHEATER 45900000 B.T.U.
SUPERHEATER
THROTTLE VALVE
TOTAL HEAT IN SATURATED STEAM FROM FUEL 21100000 B.T.U.
HEAT IN STEAM EVAPORATED BY THE FLUES 16200000 B.T.U.
HEAT IN STEAM EVAPORATED BY THE FIREBOX 16200000 B.T.U.
TO SUPER HEATER 7 1/2%
TO BOILER TUBES 63.5%
TO FIRE BOX HEATING SURFACE 27%
TOTAL HEAT AVAILABLE 60000000 B.T.U.
4320 LB COAL PER HOUR (60 LB PER SQ FT GR)
1053 INTO ASH PAN 2%

Fig. 3—Graphic Representation of the Distribution of Heat in a Locomotive Equipped with an Exhaust Steam Feed Water Heater

(Copyrighted by the Locomotive Feed Water Heater Co.)

but still remains at 388 deg. temperature. The heat that has been added without changing the temperature is called the "latent heat," and is really transformed in the work of the physical change in the structure from a liquid to a gas.

If the heat is continued after all the water is evaporated, the thermometer will again show the effect and the steam becomes superheated. The addition of approximately 111 B. t. u. will raise the temperature of the steam from 388 deg. to 588 deg., or a superheat of 200 deg. F.

For a pound of superheated steam under 200 pounds pressure and at a temperature of 588 deg. there is required about 1,282 B. t. u. if the feed water is 60 deg. temperature. Of this 837.9 B. t. u., or over 65 per cent, is the latent heat and simply keeps it in the form of steam. Therefore if steam is to be exhausted and not water from the cylinders all of this latent heat must be discharged, as well as the heat it took to raise the temperature of the water from 60 deg. to the boiling point at the exhaust pressure, amounting to over 88 per cent of the heat that goes to the cylinder. There must necessarily be some back pressure, and the higher it is the greater will be this percentage.

This latent heat, however, will all be given up if the steam is condensed back into water, and it is from this source that an exhaust steam feed water heater makes its saving.

Consider that the exhaust or back pressure is 10 lb., which gives an exhaust temperature of 240 deg. if there is no superheat. If an exhaust steam feed water heater will heat the water to a temperature within 15 deg. of the temperature of the exhaust steam, the feed water will be raised from 60 deg. to 225 deg., or a range of 165 deg., by the exhaust. This is 165 B. t. u. per pound. The condensate or condensed exhaust steam leaving the heater will have a temperature of about 210 deg., and therefore from each pound of exhaust steam condensed, 982 B. t. u. are abstracted. From this it is evident that each pound of exhaust steam will heat about 6 lb. of feed water as hot as it can be heated by this method. Thus with 60 deg. feed water and 10 lb. back pressure it is possible to use but about 16 per cent of the exhaust for feed water heating. The remainder must still be wasted until some hitherto untried method is conceived to use it.

Experiments have shown that the abstracting of 16 per cent of the exhaust does not in most cases require a reduction in the size of the nozzle to get the same vacuum in the front end and the same draft of the fire.

Table I gives in more detail the distribution of the heat in a normal locomotive. The first column gives the distribution where no feed water heater is used and the second column shows the distribution where an exhaust steam feed water heater is used. The coal is assumed to have a heat value of 13,808 B. t. u. per lb. of coal.

Table I.

	No	Yes
Feed Water Heater?		
Rate of Firing (lb. per hr.)	5,000	4,320
Coal Fired per sq. ft. of grate area (lb.)	70	60
Total heat available (B. t. u.)	69,041,000	60,000,000
Percentage of total heat to firebox heating surface	27	27
Percentage of total heat to boiler tubes	64.5	63.5
Percentage of total heat lost to ash pan	2	2
Percentage of total heat to superheater	6.5	7.5
Heat in steam evaporated by firebox (B. t. u.)	18,641,000	16,200,000
Heat in steam evaporated by tubes (B. t. u.)	27,259,000	24,900,000
Heat in saturated steam going to superheater (B. t. u.)	45,900,000	45,900,000
Heat in steam lost through radiation and air pumps (B. t. u.)	5,400,000	5,400,000
Heat added to steam by superheater (B. t. u.)	4,500,000	4,500,000
Heat in steam fed to cylinders (B. t. u.)	45,000,000	45,000,000
Heat used in work at draw bar (B. t. u.)	4,700,000	4,700,000
Heat lost in friction of locomotive (B. t. u.)	600,000	600,000
Heat in steam exhausted from cylinder (B. t. u.)	39,700,000	39,700,000
Heat in steam exhausted from stack (B. t. u.)	39,700,000	34,200,000
Heat reclaimed from cylinder exhaust by feed water heater (B. t. u.)	.....	5,600,000
Heat used to operate feed pump (B t. u.)	.....	800,000
Heat lost in sparks and gases (B. t. u.)	17,260,000	13,200,000

Fig. 3 illustrates graphically the effect of applying an exhaust feed water heater to a locomotive. It will be noted that the figures showing the B. t. us. and percentages are the same as shown in the second column of Table I. The

feed water heater is assumed to be abstracting 14 per cent of the heat in the exhaust steam. In both cases the same locomotive is considered and exactly the same amount of steam at the same pressure and superheat is supplied to the cylinders, and the same quantity of heat is used for work at the draw bar; likewise the same amount is discharged from the cylinders; yet on the locomotive equipped with the preheater only 60 lb. of coal per square foot of grate area is consumed as compared to 70 lb. where no heater is used, supplying 60,000,000 B. t. u. from the coal instead of 69,041,000, a net saving of about 15 per cent.

It will be noted in this table that some changes have been made in the proportions of the heat going to different points as shown in the second column, and that the proportion of the total heat in the coal that reappears as heat in the steam is different. This is true in actual practice, as has been shown many times by tests. It simply is an illustration of the fact that the lower rates of combustion on the grate are accompanied by a higher boiler efficiency, which condition has been mentioned previously.

It will be noted in Fig. 3 that a part of the heat coming from the feed water heater is shown as being wasted, and marked as the heat required for pumping. In this case it is considered that the steam going to the feed pump is exhausted to the atmosphere and lost. Actually, however, the exhaust from the feed pump is generally carried into the exhaust steam heater and condensed, a part of its heat being recovered.

Smoke Box Gases.—Irrespective of the use we may put exhaust steam to, we must still contend with smoke box waste. When the great volume of hot gas passing through the front end of a locomotive is considered, the possibilities of preheat from this source are apparent.

In ordinary practice the front end temperature is approximately 600 or 700 deg. F., while the temperature of the water in the boiler at 200 lb. pressure is 388 deg., and when the engine is working, the weight of heated gases may average two and a half to three times that of the water evaporated.

The heat transfer rate from hot gas to water is lower than that from exhaust steam to water per square foot of heating surface, likewise the heat per pound of gas is less than that of the exhaust, hence much greater heating surface is required per degree rise in temperature in a gas heater than in an exhaust heater. It is impracticable to design either a smoke box or exhaust heater to preheat water from the tank to boiler temperature, but ample space is afforded in the front end of the modern locomotive, in addition to that space required for superheater units, to build a gas heater of sufficient heating surface to obtain a high degree of preheat, feeding by means of the injector, the preheat increasing with the velocity and temperature of the gases.

As the final temperature of the feed water from the exhaust heater is limited to a point below that of the temperature of the exhaust steam, the smoke box heater presents greater possibilities when injector feeding is practiced, particularly when certain types of injectors are used which deliver the water at a higher temperature than that of the exhaust steam, from and above which point the smoke box heater may carry on the heating process up to the limits of the heat transfer rate for that particular design of heater and conditions of operation.

After utilizing all of the exhaust steam possible in preheating, there is still a margin of 140 deg. to 180 deg. between the feed temperature and that of the water in the boiler; and to bring these temperatures closer together we have only the waste gases to fall back upon, hence with initial temperatures lower than that of the exhaust steam the advisability of using exhaust steam and smoke box heater in connection is clearly evident.

The practical limit of preheating feed water by means of smoke box gases is that of the boiling point, which at 200 lb. pressure is 388 deg. F. If a front end heater is used independently and not in combination with an exhaust steam heater, assuming an initial feed water temperature of 160 deg., the feed water offers the possibility of absorbing 228 B. t. u. per pound. If we assume an evaporation of 7 lb. of water per pound of coal, there will be offered an opportunity of absorbing, roughly, 1,596 B. t. u. per pound of coal, or approximately 50 per cent of the heat of the gases passing out through the stack. This requires a greater heating surface than is obtainable in the ordinary smoke box, due to space limitations. It is apparent that the higher the percentage of the available B. t. u. in the gases absorbed by the preheater, the greater is the efficiency.

Axioms of Preheater Construction

Six principles for feed water heating of all types, most of which have been confirmed by separate boards of engineers in France and England, cover the essential features very closely. These are as follows:

1. The apparatus should present simplicity of construction and facilitate examination, cleaning and overhauling.
2. The heater should take up as little room as possible, and be of a minimum weight.
3. It should give continuous and certain supply of hot water.
4. Feed water should be heated by steam or gas, otherwise lost.
5. The steam used for heating should vary with the quantity of water required by the boiler.
6. Smoke box heaters should be placed within the path of the hot gases, presenting the smallest gas passage section practicable without detriment to draft.

Boiler Feeding

It is advisable beyond question to use a water pump in connection with exhaust steam water heaters for the following reasons, assuming that a satisfactory pump may be developed for the rough usage of locomotive practice: It has been clearly shown that the amount of waste heat that can be abstracted from the exhaust is dependent entirely upon the range over which the water can be heated. The upper point of this range is fixed by the temperature of the exhaust steam, which naturally cannot be exceeded, and therefore the inlet temperature should be as low as possible in order to get the widest range of temperature change and reclaim the largest amount of waste heat that is feasible. The inlet temperature cannot be below the temperature of the water in the tank, but it should not be above this. Therefore it is undesirable to raise the temperature by live steam, as would be the case if an injector were used before it enters the heater. For instance, take the case mentioned above, where the injector raised the temperature of the feed water over 100 deg. by means of live steam—this would simply mean the impossibility of abstracting over 100 B. t. u. from the exhaust steam for each pound of feed water which could otherwise be reclaimed. With hot gas preheaters this does not apply, as the heat available from this source may be absorbed in addition to that heat supplied by the injector.

Conclusion

Preheat is a fundamental necessity, easily within our grasp, which can no longer be overlooked. The failure of American railways to utilize preheat is an economic mistake which may be expressed in terms of millions of dollars of lost earnings.

The report is signed by: Monro B. Lanier, chairman, Prof. E. C. Schmidt, G. M. Basford, A. B. Appler, L. G. Plant, J. L. Hampson, O. C. Wright, and F. Kerby.

Discussion

There have been numerous trials of feed water heaters extending over a period of many years. Difficulties experienced with the apparatus have always led to its abandonment. The question of maintenance is therefore of extreme

importance and in designs which are now being tested this feature has been given special consideration. In exhaust steam heaters the speed at which the water travels gives a high rate of heat transfer by reason of the scouring action and is also effective in keeping the surfaces clean. The introduction of feed water heating gives promise of further increasing the thermal efficiency of the locomotive which has been brought from 3½ to 8 per cent in the last two decades.

GRAPHIC DISPLAY OF INDIVIDUAL DAILY FUEL RECORDS

By Hiram J. Slifer

The cost of fuel is one of the largest of the individual items that go to make up the total expense of railway operation. This fuel is used by 99,070 locomotive enginemen, divided into classes as follows:

Engineers and motormen, yard	12,797
Engineers and motormen, road—freight	24,226
Engineers and motormen, road—Passenger	12,075
Firemen and helpers, yard	13,013
Firemen and helpers, road—freight	25,210
Firemen and helpers, road—passenger	11,749

These men were employed on 64,950 locomotives (301 electric, 8,688 switching), and hauled 32,334,466 passengers

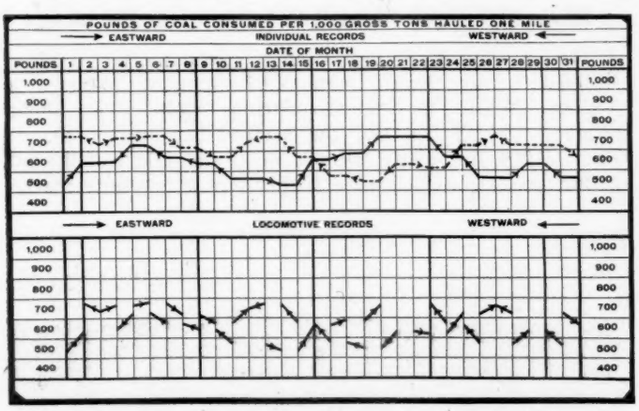


Fig. 1—Graphic Picture Showing Coal Consumed per 1,000 Gross Ton Miles

and 277,232,653 tons of freight one mile in the fiscal year ending June 30, 1915.

The magnitude of the question of interesting the employes in the importance of reducing the pounds of coal used may be considered stupendous, and it would be almost impossible to suggest any method for doing so, if its consideration is confined to the foregoing statistics. It is the purpose of this paper, however, to suggest an analysis of these statistics for the purpose of simplifying them, in order that they can be applied to the unit-man and the unit-machine in their respective classes of service, expressed in pictures that will be understood and interesting, creating a competition that will reduce the unit consumption of coal.

In the first place, two grand divisions of the subject suggest themselves: fuel used by yard locomotives, and fuel used by road locomotives. The latter may again be subdivided under many headings, some of which are suggested:

Passenger	Freight
Mail trains	Stock trains
Limited trains	Meat trains
Express trains	Fruit trains
Through trains	Coded trains
Local trains	Dead freight trains
	Local trains

It is necessary that each of these classes be considered independently of the others, and for the purpose of illustrating how the graphical method may be applied to show the daily performances of individual men and machines the consideration of the subject is confined to the dead or drag freight trains, for the reason that they are in a class that predominates and consumes the larger percentage of the fuel.

For the fiscal year of 1915 there were 9.8 enginemen and motormen and 10.2 firemen and helpers employed in freight train road service per 100 miles of line, and it should be safe and fair to estimate that an average freight division will not have more than five dead or drag freight trains passing over it in each direction every 24 hours. With this basis it should be a very simple problem to devise some graphical method by which may be shown a comparison of the amount of coal consumed by each of these 10 machines and the men employed thereon, to haul 1,000 tons one mile. The method must naturally be so flexible that it may be curtailed or extended to cover as few or as many men and machines as may be employed, and it must be applicable to all classes of yard and road service. It should be of such a character as to suggest its use and value for interesting other classes of employes than those engaged in the consumption of fuel. And it should be of a simple character, and not too expensive for its installation and maintenance.

Some the railroads have been for years, and are now, preparing daily statistics for the use of their general and division operating officers, and these are being secured by wire advice sent regularly to the chief despatcher. Such roads are already provided with the necessary data for determining the pounds of coal used, the tons hauled and the miles made by each individual and each machine. Other railroads should have no difficulty in establishing a similar system. Every despatcher's sheet now shows or should indicate the tonnage and mileage of every train on his district, and messages will give him a complete daily fuel record, when a few simple calculations will show the pounds of coal consumed in hauling each unit of 1,000 tons for a distance of one mile. If these figures in turn were wired to the master mechanic or the engine house foremen at the terminals, they would be available for illustration, as they are now on many

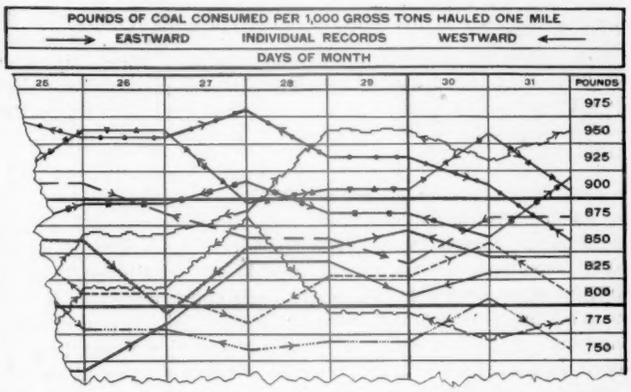


Fig. 2—A Detail View of the Corner of the Graphic-Picture Coal Consumption Board

miles of railroad. Up to this point there would be very little, if any, additional expense attached to the suggested plan.

The next step will be to establish the necessary boards on which these figures may be shown, through the medium of graphics. These will involve some slight expense, and this will be the only additional cost that will have to be met, as it is expected that some employee will be assigned to the few moments' duty that will be necessary to mark up the day's record.

These boards should be on the walls of the rooms in which the enginemen register for duty. They should be conveniently located and well lighted. They may be of simple construction, with black background and white lines. The question of the number of boards to be maintained will depend on many things aside from the various classes of service to be covered. It will also be governed by the space

which may be assigned to the boards. Every effort should be directed against any possibility of confusion, which will reduce the interest desired and expected. If the division is double track and of even grades in both directions, all of the records might be displayed on the same board by showing the direction of each train with an arrow, but where it is single track or grades predominate in one direction of traffic, the board should be divided to show the trains in each direction, which will mean the erection of a second board. The records on these boards may be made with white chalk, using different characters to represent each individual and machine, the characters to be known only to the officer and the man interested. If desired, the locomotive may be identified by placing its number and character on the board.

The wall space available will dictate the shape, size and scale of these boards, which may be varied to suit the conditions. However, the vertical and horizontal proportions should be such as to show the daily unit consumption, distorted as much as possible, so as to emphasize the variations in the amount of coal used. A horizontal scale of 3 in. for each day, with a column for pounds on each side, will require a board 8 ft. wide; a vertical scale of 4 in. for each 100 lb., with the necessary space at the top for proper headings, another at the middle to separate the individual from the locomotive performances, and a third at the bottom for recording engine numbers, with their character, or other information if desired, will require a board 5 ft. high to cover a variation of 1,000 lb. Such a board is shown in Fig. 1 with the record of one engine as worked by two men.

Some idea of the working appearance of the suggested board is shown in Fig. 2, which covers only one corner of the complete board, but which will show its application. This board shows coal consumed on the basis of gross tonnage, but the same principle may be applied to net tonnage and it may be modified as may seem desirable. It is believed that the employees will soon show by their improved records that the graphic representation of performance displayed each day, has created an interest that will repay the slight expense of its adoption in a very short period of time.

Discussion

In the opinion of the members, keeping records of the coal used by each locomotive would have a marked effect on fuel consumption. Graphical records are readily understood by the men and showing where each engineman stands has a good moral effect. The Baltimore & Ohio has used with notable success a system of rating the coal consumption of each locomotive and enginemen on the basis of an allotment for the particular class of service.

OTHER BUSINESS

Committee reports on Fuel Tests, Powdered Coal and Storage of Coal were also presented. Abstracts of these reports will be published in future issues.

A paper on Fuel for Small Furnaces was presented by Joseph Harrington, which dealt with the construction and operation of furnaces using oil and powdered coal. A paper on Soot was also presented which took up the matter of deposits from fuel on the heating surface of boilers and emphasized the advantages of mechanical soot cleaners. The standing committee on Front Ends, Grates and Ashpans made a progress report.

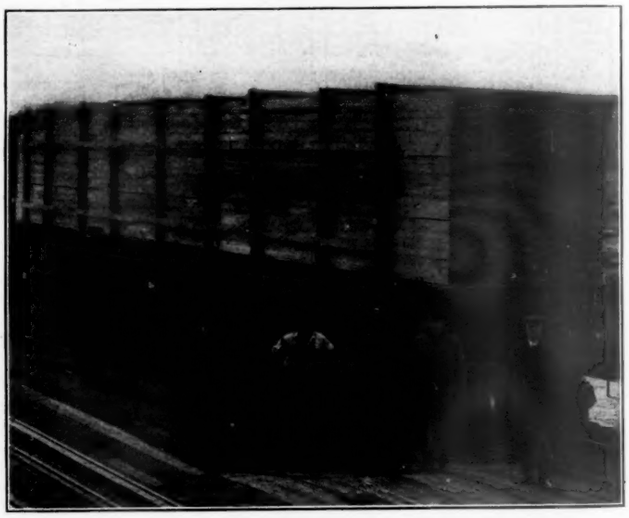
A. I. Lipetz, of the Imperial Russian Railway administration, told of the methods of conducting road tests used in Russia. At the closing session a resolution was adopted to the effect that the association offer its service to the Council of National Defense and to the American Railway Association. The executive committee was empowered to appoint a committee to work with these bodies. The secretary reported a large increase in the number of members, the membership of the association at the time the convention opened being 739. The president suggested that a membership more representative of both the mechanical department and operating department and of all sections of the country was desirable.

The finances of the association were reported in a satisfactory condition.

The following officers were elected for the coming year: President, E. W. Pratt, assistant superintendent motive power, Chicago & North Western; vice-presidents: R. Bradley, inspector fuel service B. & M.; L. R. Pyle, fuel supervisor M., St. P. & S. Ste. M.; W. L. Robinson, supervisor fuel consumption B. & O. Executive committee: For two years, W. C. Arter, supervisor apprentices, N. Y. C.; W. J. Bohan, mechanical engineer, N. P.; W. P. Hawkins, fuel agent, M. P.; J. D. Hurley, general road foreman, W., and H. B. McFarland, engineer tests, A., T. & S. F.; for one year, H. Woods, fuel inspector, C. & S. Of the five cities from which the executive committee will choose the place for the next meeting Chicago received the greatest number of votes.

RECORD FOR LUMBER LOADING BROKEN

The St. Paul & Tacoma Lumber Company, on April 12, shipped a car loaded with 60,973 b.m. of lumber from Tacoma, Wash., to Colorado Springs, Colo. The lumber weighed 154,000 lb. and the marked capacity of the car was 140,000 lb. Thus full advantage was taken of the rule permitting cars to be loaded 10 per cent above their marked capacity. This is the best record for lumber loading that has yet come to the attention of the *Railway Age Gazette*. In the same train with the record car of lumber were contained two other open cars of lumber averaging 50,000 b.m. per car.



60,973 B. M., 154,000 Lb.

Railway Concession in Panama.—The National Assembly of Panama has approved a contract made with Basile Burns Duncan for the construction of a railway on the Atlantic coast of Panama, starting from the mouth of the river Chagres and running southwest for at least 50 kilometers (31 miles) to the city of Almirante. The concession is for 75 years, but the government reserves the right to purchase the road after 30 years. The text of the contract, in the Gaceta Oficial of March 23, requires the completion of the railroad within five years.

National Association of Owners of Railroad Securities

Representative Owners of Railroad Securities to Protect the Interests of Fifty Million Individuals Interested

ON May 22, S. Davies Warfield, president of the Continental Trust Company of Baltimore, called to order a meeting of insurance company officers, savings bank officers and individual investors for the purpose of forming a permanent organization which would be ready to represent, before the Interstate Commerce Commission and public utility commissions, the interests of the owners of stocks and bonds of American railroads.

In his opening address Mr. Warfield outlined the great opportunities which an association such as he had in mind now had before it.

Mr. Warfield's Address

The call for this conference was sent out by me as a large individual owner of railroad securities, as the largest stockholder in the railroad with which I am connected. While I knew the feeling of investors by reason of occupying the presidency of one of the trust companies of this city, there seemed to be no one taking the initiative at a time which I think we will all feel is a crisis in the affairs of our properties. It seemed to me that the time had arrived when by concerted action those owning the securities of the railroads should present to the public and those in authority the situation confronting the railroads as affecting their efficiency, their credit, and consequently, their securities.

The railroads are required to pay out by reason of increased prices this year over last year for equipment, supplies, materials and labor over $570,000,000. The items composing this vast sum are as follows: Increased price for fuel, $100,000,000; for locomotives and cars, $195,000,000; materials and supplies, $162,000,000; wages of trainmen, $60,000,000; increased wages of other employees, $57,000,000. To help to meet this the railroads have asked for an increase in their rates of 15 per cent. This increase will not begin to make up this huge sum; nevertheless, there seems to be considerable doubt whether it will be allowed, opposition having developed in certain directions. The railroads very properly and patriotically have appointed a committee of five well known railroad presidents to direct the operation of all the railroads entirely in the interests of the government, which at this time is in the interest of the war. We are confronted with an extraordinary condition. The railroads are now operated under a plan devised by themselves in the interest of the government in this emergency, without respect to either their individual operators or owners. The government of England at the outbreak of the European war guaranteed to its railroads during the period of the war earnings equal to those of the year previous to the outbreak of the war.

The presidents of the railroads have ably presented to the Interstate Commerce Commission the situation from an operating standpoint. It remains for this conference to determine whether this body should now present the credit side.

Every citizen of the country is doing his utmost in subscribing or securing subscriptions to the Liberty Loan. Any impairment of railroad credit must have its effect in limiting the investing power of those of our citizens who are dependent upon the returns from their investments in railroad securities to enable them to subscribe to this loan.

The Interstate Commerce Commission has its difficulties. Let us recognize them. It is now hearing protests against the increase in rates requested. I have here resolutions of chambers of commerce, boards of trade, and other bodies, and letters from a great many shippers throughout the country, numbering several hundred, and there are many more endorsing the increase asked as essential to securing the prompt and efficient despatch of the business of the country through the proper equipment and operation of the railroads.

This conference has for its object the protection of the credit of the railroads of the country. The railroads represent in capital approximately $17,000,000,000. Together they constitute the greatest business organization in the world, and the greatest aggregation of capital. They are the arteries of the nation and consequently the arteries of trade. Whatever adversely affects their credit correspondingly affects the credit structure of the country; it affects railroad efficiency and hence the proper and effective conduct of the war. Upon their efficiency and preparedness at all times depends the industrial and agricultural prosperity of the nation, as well as the insurance in times of war of one of the country's most effective agencies in its conduct.

The securities of the railroads are owned as follows:

By individuals outright, numbering about 2,000,000, owning over $10,000,000,000.
By life insurance companies, with 34,500,000 policy holders, representing a total of $1,920,000,000.
By savings banks with 10,000,000 depositors representing $840,000,000.
By fire and marine insurance companies, casualty and surety companies, with holders representing a total of $649,000,000.
By benevolent associations, colleges, schools, charitable institutions, etc., $350,000,000.
By trust companies, state and national banks, $850,000,000.
Balance held in channels not enumerated, mostly abroad.

The life insurance companies have an army of policy holders owning insurance policies of $2,000 or less. The proportion of the money belonging to the policy holders and invested by their respective insurance companies in securities of the railroads represents approximately 37 per cent of all the investments held by the life insurance companies. Therefore, every small policy holder of $2,000 or less and every other one of the 34,500,000 holders of life insurance policies is an indirect owner or investor in the securities of railroads to the extent of 37 per cent of his investment in his life insurance company represented by his life insurance policy. And his policy in most cases is to insure the maintenance of those who are to come after him.

Without presenting in detail similar comparisons in the case of holders of fire insurance policies, which protect policy holders against conflagration; savings banks with their 10,000,000 depositors, all with their pro rata indirect ownership in the railroad securities owned by the banks; fire and marine insurance companies; surety and casualty companies; benevolent associations, colleges, schools and charitable institutions; trust companies, state and national banks, with their pro rata interest of their stockholders, suffice it to say that in the aggregate over 50,000,000 people, half of our population, are either direct or indirect owners of or investors in the securities of the railroads of the United States. They are, therefore, intimately concerned in whatever affects railroad credit with its corresponding effect on the securities of the railroads they own or in which they have the indirect interest mentioned above.

Through years of abuse of the railroads a "state of mind" has been created which seems to forbid the consideration, in a spirit of fairness, of questions of vital consequence to the railroads and those who in good faith have invested their money in their securities. The present day owners of these securities, representing millions of our citizens, should be considered in the settlement of these questions and not made responsible for the acts of a few men who may, in the past,

have unduly profited at the expense of the properties they represented. The time has passed for this. Laws have been or can be enacted to prevent recurrences. The real owners of the railroad properties, the owners of the securities, should now be heard.

We should call upon the press of the country, the millions of men and women who have their money in railroad securities represented either by the bonds or stocks of the railroads, by the life insurance policies they own and through which they are interested in the securities, in savings banks and the others interested, to do their part in bringing to the attention of those in authority the necessity of maintaining the credit of our railroads, the greatest of our enterprises and which have done so much more than any other single agency towards the development and the prosperity of our country—the richest nation in the world.

Mr. Ecker's Address

Mr. Warfield then called on Frederick H. Ecker, treasurer of The Metropolitan Life Insurance Company of New York. He said in part:

We have viewed with grave concern these matters which have been mentioned, of the increasing cost of operating the railroads, of the testimony which has been presented by those who speak with authority telling us of the dangers to and difficulties in the way of the railroad systems. It has occurred to me that it might have been better, perhaps not better but wiser, to have added to the testimony presented by the railroads, testimony from one or two of the smaller roads. To be sure, the evidence which has been put in by the presidents of the great railroad systems must be very convincing, but if all they have told the commissions be true with respect to those strong, well-established railroad systems, how much more so must it be true of the smaller systems throughout the country!

Doubtless the whole subject of the railroads and their condition will be discussed, and that is not my purpose. I noticed the statement of the chairman to you as to the condition of the life insurance companies. I think he was quite conservative in his statement. I think there are about forty-six millions of policies in force, representing about twenty-five billions of insurance, which is an average policy of about $530, and if the fraternal bodies were included, it would mean a per capita policy of $230, that, of course, only indicating the extent to which, indirectly, the entire population of the United States is interested in this subject. That indicates the great number and the far-reaching interests in the railroad securities.

Insurance companies have admitted assets of $5,750,000,000 and of these admitted assets they have in railroad securities more than $1,500,000,000, which is about one-tenth of the bonded and stock capitalization of the railroads.

There is a question which, it seems to me, is important today, and although I do not want to go into the discussion of the details of it at all, yet it is one which has impressed me as being of very great importance and a subject which it would be wise for a conference of this kind to give serious consideration to, that is, the whole system of control and rate fixing by Interstate Commerce Commission and public service commissions. I assume that our public service commissioners are very able men and have sought to do exact justice to all the interests concerned, and in the fixing of rates they go about it in a thoroughly business-like manner. Taking the gas company as a sample of public utility, I presume that the rate is fixed by determining the cost of the raw material and the cost of labor, and then adding a reasonable return on the capital invested for the plant that produces the product, and saying that is the rate. Now, that is very good and sounds logical, and the whole system works satisfactorily under normal conditions. Under conditions such as obtain today, when costs of material and labor have changed so materially, the question is: Does this method fall down? If we have any absolute cast iron, rigid rules of rates, or when the rates are fixed that have no flexibility, what then is the position of owners of securities? Does not that bring us to a consideration of the question of whether this system now obtaining and in practice is all that could be desired? Is it true and does it follow that this system is now on trial, and is that a subject that it would be wise for this conference to give serious consideration to, of bringing the whole subject before the people of whether the method of fixing rates is not now on trial? Of course it comes home to us as holders of securities.

I assume that there are only three fundamental holders of securities: savings banks, life insurance companies and individuals. Only the savings banks and life insurance companies may be properly termed permanent holders of securities. With individual owners, although buying for permanent holding, the term of ownership ceases with the life of the individual. The great banks and insurance companies buy as a rule, not for temporary ownership and to turn over for a profit, but to hold to maturity, and if there is any stabilizing influence, I presume that it is the influence of the permanent investor. When we represent here today, as the chairman has said, practically one-fifth of the entire investment in railroad securities, we are largely that stabilizing influence. More than one-fifth of the entire seventeen billions is represented in this meeting, and it seems to the interests that I represent that this is a very appropriate time for us to seriously consider this whole subject.

Other Speakers

Following Mr. Ecker's address, H. A. Schenck, president of the Bowery Savings Bank of New York, spoke. He strongly endorsed the position taken by Mr. Warfield and said that the association of mutual savings banks of New York city and New York state had 140 members and represented over two billions of resources and of this amount over three hundred and fifty millions dollars represented holdings of railroad securities.

Following Mr. Schenck, J. B. Oldham of Merrill, Oldham & Company of Massachusetts, spoke. He pointed out that in all the railroad hearings that have been held before the Interstate Commerce Commission or other commissions, it has been the railroad and the shipper that have been heard and that there has never been an organized movement to bring the point of view of the investor before these regulating bodies. He said, "There are about 84 systems which do about 92 per cent of the railroad business of the country. Of those 84 systems, 36 systems are in good standing so far as their financial organization is concerned. About all those railroads need is sufficient encouragement, so that investors in their securities may feel that the cost of capital is just as important a part as the cost of labor and material. The investors want to know that there is an intelligent body which will give the proper consideration to the question of rates and be sure that the investors get their return on capital. Now what is a fair and reasonable return? My view is that it is the return which will encourage investors to take additional securities in the future."

J. W. Stedman, President of the Prudential Life Insurance Company, spoke as representing a mutual concern, owned by over eleven million policy holders. He said that 40 per cent of the assets protecting these policy holders consisted of railroad securities. Of these eleven million policy holders, ten million were members of hard working families of moderate means.

Ex-Governor Stokes' Address

The chairman then called on ex-Governor Stokes of New Jersey who spoke in part as follows:

I want first to thank the chairman for inaugurating this movement. He has fulfilled what the newspaper men would

call a long-felt want, and this gathering is an evidence of the response to the movement which he has inaugurated. The American people are long-suffering and slow to wrath, and I have been wondering for the last decade how long the stockholders and security holders of our railroads would suffer a gradual impairment of their property without a united effort to just and proper treatment. For five years I have, in a modest way, suggested to some of the railroad presidents of this country, the natural guardians of their bondholders and stockholders, that they should insist before the Interstate Commerce Commission that the thousands of investors had rights just the same as other people have rights, and that their property was just as sacred and entitled just as much to protection as the property of the farmer in the country or the householder in the city. You know sometimes our railroad presidents are timid when they look the government in the face, but no man ever yet obtained his rights by peacefully submitting to a wrong. I have had a dream for some years of a movement of this kind, but up to this time the dream has proved futile. Time, however, solves all problems. This is an age of revolution. Even Russia has become a republic. Now, the American railway investors are a little slower than the Russians. They are at last arising from their lethargy, and what a wonderful and influential army they make when organized into service.

There are eleven million depositors in the savings banks of this country and they are interested in the solvency and prosperity of the American railways. I was amazed to hear Mr. Ecker give the figures of the life insurance policies. I think you said, Mr. Chairman, there were thirty-four million holders, and with other securities I think you said represented seventy-five million dollars. Every one of these policy holders is interested in the solvency and prosperity of the American railway systems. There are thousands of stockholders of banks and trust companies in this country, and they are all interested in the solvency and prosperity of the American railway system. There is a gross capitalization of the railroads of this country of twenty billions of dollars covering stocks and bonds and other evidences of indebtedness. You know since the outbreak of the war we have been talking about billions in rather a careless fashion. Even an economical congress had adopted that term as part of its vocabulary, and I sometimes wonder whether we realize what a billion dollars means. To make it a little more emphatic I sometimes illustrate it in this way. Taking the Bible chronology as verity, if Adam had begun to work when he was first placed in the Garden of Eden; if he had never lost a day for sickness or gone to a baseball game; if he had never paid his landlady his board; if he had remained a bachelor like myself and never bought any shoes or clothes for his wife or children, and if he had received union wages at the rate of one dollar a minute, that is $60 an hour or $600 a day, and had saved all his earnings, he would just about now have amassed a billion dollars. You know they say Rockefeller amassed this sum in less than fifty years, but Rockefeller was an American and Adam was a foreigner who never struck oil.

All these resources we have been talking about are owned by somebody, and they are the people of this country, the people like you and me. Of the 102,000 investors in the Pennsylvania Railroad there are 48,000 women. Eleven thousand own the Lehigh Valley. You can count them up until you have a great army of investors and I was glad to hear Mr. Warfield say that there are 50,000,000 people in this country financially interested directly or indirectly in our American railway system. And every loyal patriotic American takes a just pride in the railway systems of the country.

In the afternoon a permanent organization was formed with S. Davies Warfield as president and a committee representing all sections of the country.

RATE ADVANCE HEARING

Cross-examination of railroad executives who testified before the Interstate Commerce Commission recently to urge the need of a 15 per cent increase in freight rates was begun at Washington on Wednesday by representatives of the shippers. Three days were allotted for cross-examination on behalf of the shippers and it was decided that the three days should be divided between the eastern, southern and western roads. The examination of the representatives of the eastern lines was completed on Wednesday.

Julius H. Parmelee, statistician of the Bureau of Railway Economics, was asked a few questions on the statistical exhibits he had introduced at the previous hearing, by Clifford Thorne, who devoted his efforts principally to showing that the Pennsylvania had been able to add to its property investment out of earnings. Mr. Thorne continued this line of questioning with Samuel Rea, president of the Pennsylvania, whose examination occupied most of the day. Mr. Rea said the Pennsylvania Railroad had added to its property from surplus and earnings a total of $95,778,000 since 1907, and also that it had expended $200,000,000 of earnings which had never been included in its property account.

Mr. Thorne also asked numerous questions regarding what he called the company's "outside" investments, carried on the books at $307,000,000 and which produce an income sufficient to pay the interest on the company's funded debt. Mr. Thorne asked if this investment did not serve the purpose of a surplus. Mr. Rea explained that the company had disposed of its investments except those in property held for transportation purposes.

Mr. Thorne also tried to show that the plan of operating the railways as a national system during the war would result in great economies that would improve the earnings of the roads, and he read the bulletin issued by the railway war board pointing out ways in which the roads could greatly increase their efficiency. Mr. Rea replied that the purpose was primarily to increase the efficiency of transportation so that the preferred service required by the government may be furnished, as there is now not enough transportation to go around. Economy is only a secondary consideration, he said. The primary purpose is to give the government service even if it costs more. While it is hoped that eventually the roads may be able to effect economies, the realization of all the suggestions contained in the bulletin was a large problem and that many things will have to be set aside in order to meet the requirements of the government. He mentioned the fact that many railroads have been called upon to rush large numbers of empty cars for government shipments which involves uneconomical empty hauls.

Mr. Thorne also asked Mr. Rea if he would oppose a plan of government regulation of prices of railway supplies and fuel. Mr. Rea replied that if the administration and Congress considered such a plan necessary as a war measure he did not know that he would oppose it, but that generally speaking he would be very much opposed to an idea such as this is.

L. F. Loree, president of the Delaware & Hudson, was questioned briefly by L. M. Walter, of Morris & Company, Chicago.

L. E. Johnson, president of the Norfolk & Western, took the stand just before adjournment.

The various statements requested by the commission at the instance of the shippers and state commissioners at the close of the last hearing have been filed by the various roads in printed form. These consist of answers to the list of questions suggested by the commission on May 1 by executives of some of the principal roads that have not testified, and also data regarding fuel and supply contracts and securities issued during the past 10 years.

RAILWAY RATES ADVANCING THROUGHOUT THE WORLD

Advances in freight and passenger rates do not constitute a need peculiar to American railroads but have been a necessity of railways throughout the world during the last decade, according to statistics recently compiled by the Bureau of Railway News and Statistics, Chicago. The same economic forces which have steadily increased operating costs in the United States have affected other countries with the result that the last ten years have been characterized by advances in transportation rates throughout the world. Beginning in 1906, when effective downward regulation of railway rates started in the United States, other countries have been recognizing the needs of their transportation systems by allowing them increased revenues. Most of the advances have occurred since 1910, when the federal power of suspending rates took from American railroads all power to adjust rates to operating costs. The recent advances in foreign lands have been made for generally similar reasons. Rising wages, higher fuel costs, advancing prices of all materials, have forced all countries to choose between the alternative of inadequate transportation service or higher rates, and the decision has generally been on the side of advanced rates. A considerable number of the foreign railway systems covered in the statistics are owned and operated by the governments.

The statistics of rate increases follow:

Argentine Republic

Oct. 1, 1915—Advance of 10 per cent in freight and passenger rates, estimated to yield about $8,000,000.

New South Wales

1914—Passenger fares advanced 5 to 50 per cent. Freight rates advanced 10 per cent.

South Australia

Jan. 1, 1916—Freight other than wheat, oats, barley, flour, etc., increased 10 per cent. Free service abolished. Round trip tickets outside metropolitan area abolished, except excursion tickets. These increased from 1⅓ to 1⅔ fares. Traders' tickets concessions withdrawn.

Victoria

Oct. 1, 1915—Passenger fares advanced 5 to 10 per cent, suburban, and 5 to 12½ per cent through. Parcel rates advanced 10 per cent. Freight rates advanced 5 to 33⅓ per cent.

Western Australia

April 26, 1915—Season ticket and excursion rates increased; parcel rates increased; traders' and commercial travelers' concessions abolished.

Austria

1910—Passenger and freight rates advanced. Added revenues over $2,000,000 first year and $6,000,000 in later years.

1911—Many rates in local freight tariffs of state railways increased.

Jan. 1 and May 15, 1912—Rates for bulky commodities, like cement, sugar, spirits, coal and wood for export advanced.

1913—Additional advances in freight rates.

Nov. 11, 1916—Demurrage charges raised 200 per cent.

Jan. 1, 1917—Cheap season tickets for longer period than 1 month abolished; free transport of salesmen's samples abolished.

Feb. 1, 1917—Freight rates advanced 30 per cent. Military tariffs advanced in same ratio. Additional revenue anticipated $40,000,000 yearly. Also some advance in passenger fares.

Belgium

1913—Five-day tickets advanced 11 to 14 per cent to meet wage advances. Stamp tax raised from 20 to 50 centimes (4 to 10 cents). Increase of 50 centimes (10 cents) per ton on short haul shipments of coal.

Canada

1913—Government Intercolonial Railway advanced local freight tariffs 1 to 8 cents per 100 lb.; in some cases 25 per cent.

July 6, 1916—Freight rates on eastern roads advanced, according to destination, 2 to 6 cents, 1st class, and 1 to 3 cents fifth class, advances on intermediate classes being proportionate. Commodities rates advanced ½ to 1½ cents per 100 lb. on iron and steel; about 5 per cent on pig iron, rails, etc.; 10 per cent with 10 cents per ton maximum on coal; 5 to 10 cents per ton on coke. Many other commodities advanced. Commodity rates on hay and leather abolished.

Denmark

1903—Rate advances equaling $509,200.

1908—Further advances equalling $261,300.

Dec. 1, 1911—State railways make general advance in passenger fares, equalling $1,031,800, or about 15 per cent of passenger revenues.

Jan. 1, 1912—Freight rates, including live stock, advanced 9 per cent.

England

Jan. 12, 1912—About 5 per cent increase in reduced fare tickets and commutation tickets.

July 1, 1913—4 per cent advance on freight except coal and coke: 5 per cent advance in round trip and weekly excursion tickets; 2½ to 5 per cent in commuter's tickets.

1913—Government increases compensation for carrying mails.

Jan. 1914—Excess baggage rates advanced, ranging up to 100 per cent on shorter hauls.

Jan. 1, 1917—Passenger fares advanced 50 per cent excepting necessary travel by workmen and holders of season tickets.

France

1917—Government contemplates 15 per cent advance in freight and passenger rates.

Germany

1907—Passenger fares in various states advanced incident to unification of tariffs.

1910—Wurtemberg advances fourth class passenger fares.

1913—Free baggage allowance of 56 lb. abolished and round trip fares increased.

1915—Accessory charges on freight advanced, including demurrage and storage.

Holland

1909—Advances in rates incident to unification of tariffs.

1916—Advance of 10 per cent in domestic freight rates. Export rates advanced 20 per cent on less-than-carload and 10 per cent on carload freight.

Hungary

Jan. 1, 1910—Fast freight rates advanced 6.5 to 35.6 per cent. Slow freight rates advanced 2.5 to 30 per cent.

Mar. 1, 1912—Fast freight advanced 7 per cent, slow freight advanced 5 per cent.

Apr. 1, 1912—Passenger fares advanced 13 to 14 per cent for 100 kilometer (62 mile) zone and 15 per cent for 200 kilometer (124 mile) zone.

July 1, 1912—Zone passenger tariffs in effect since 1889 abolished and replaced by kilometer tariff 20 per cent higher.

Feb. 1, 1917—Freight tariffs and military tariffs advanced 30 per cent. Additional anticipated $24,000,000 yearly.

Ireland

Nov. 1915—Freight rates advanced 10 to 15 per cent on Midland Great Western.

1916—Freight rates advanced 6 cents to $1.25 a ton on Dublin & Southeastern, following advances in 1915.

Feb. 1, 1917—Freight rates including live stock, on shipments to England advanced to statutory maxima.

Italy

April, 1911—Freight rates advanced 2 per cent.

August, 1911—Season tickets advanced 9 per cent; round trip tickets, 6 per cent, 2½ cents per ton increase in despatching fees on freight. This increase in accessory charges on freight equalled about 1 per cent of freight revenue.

July, 1914—First class fares in express trains, fast trains and de luxe trains advanced 10 per cent; second class 5 per cent. Former 30 per cent reduction on round trip tickets cut to 20 per cent. Tariff increases result from increased wages set by laws of July 23, 1914, and April 13, 1911.

Feb. 1916—All round trip tickets advanced 10 per cent. Season and commuters' tickets advanced 10 to 15 per cent. All local and special tariffs on freight or live stock advanced 2 per cent. Increases result from price of coal and other materials.

Sept. 1916—5 to 10 per cent advance in certain freight tariffs due to continued advance in cost of operation.

Norway

1906—Passenger fares increased to meet wage increases since 1900.

1913—Passenger fares increased again to meet wage increases of 1907, 1908 and 1909.

1915—Freight rates increased.

Portugal

1915—Passenger and freight rates advanced 10 per cent due to cost of fuel and other materials.

Roumania

May 1, 1913—General advance of 5 per cent on state railways.

July 1, 1916—Passenger tariffs advanced 15 per cent; baggage rates increased; fast and slow freight rates of nearly all kinds advanced 10 per cent. Added revenue expected about $2,500,000, about 12½ per cent of all revenues.

Russia

1902—Passenger tariffs advanced.

1907—Freight tariffs advanced.

1908—Passenger tariffs advanced.

1910—Freight rates on large number of manufactured articles considerably advanced. Some passenger fares also raised.

1915—Tax of 25 per cent on prices of passenger tickets of four classes, on baggage and other merchandise carried on passenger trains. Taxes also put on freight, replaced later by general tariff increase designed to produce about $65,000,000, about 12½ per cent of all revenues, of which $40,000,000 for state railways and $25,000,000 for private.

Sweden

Sept. 10, 1915—State railways, third class sleeping car rates advanced 20 per cent; first and second class remain at level 43 per cent higher than American. All free baggage allowances abolished. Passenger fares advanced by fixed amounts of 1.34 to 13.40 cents, the ratio being largest on cheaper short journeys. Monthly tickets, second class, increased 40 cents; first class, 13.4 cents. Party tickets, second class, increased 21.4 cents; third class, 8 cents. Fast freight rates advanced 1.07 cents per 22 lb. l.c.l. and 8.04 cents per 220 lb. c.l. Ordinary freight advanced 3.22 cents to 5.32 cents per 220 lb. l.c.l. and 1.07 cents to 3.22 cents c.l. Additional revenue to state roads, $2,000,000, about 8 per cent of all revenues.

1915—Private railways follow state advances.

1917—Department of Railways pronounces additional advances necessary due to cost of coal and other materials.

SWITZERLAND

1909—Season tickets advanced 8 to 18 per cent.
1912—Season tickets advanced 9 to 12½ cents.
1914—Round trip tickets advanced, first and second classes 20 per cent; third class, 25 per cent.
May 1, 1916—Season tickets advanced about 10 per cent. Advances also in freight rates.
1916—Taxes on various tickets and shipments increased.
1917—Additional passenger rate advances pronounced necessary due to coal prices.

UNITED STATES

May 31, 1910—Injunction prevents increase in freight rates proposed by railways.
Feb. 23, 1911—Denial of freight rate advances on ground that no need was shown.
Aug. 2, 1914—Need for greater revenue recognized but advances east of Pittsburgh denied, roads being told how to secure relief through economies. Roads in central freight territory awarded about $10,000,000 increase per year, about 1½ per cent of revenues.
Dec. 16, 1914—On rehearing due to war, roads east of Pittsburgh awarded between $20,000,000 and $30,000,000 relief per year, 1½ to 2 per cent of revenues.
1914—Slight increases allowed in eastern passenger fares.
July 30, 1915—Western roads granted relief of $3,000,000 per year, about ¼ of 1 per cent of revenues.
Dec. 7, 1915—Increases allowed in western passenger fares.

DEFENSE COMMITTEE AND QUARTERMASTER GENERAL ADOPT DEMPSEY CODES

The special committee on national defense of the American Railway Association and the Quartermaster General of the United States Army have adopted codes for use in handling military movements which are being specially prepared for that purpose by J. Edwin Dempsey, author of the Dempsey Telegraphic Cipher Code, described in the *Railway Age Gazette* of December 1, 1916. The code designed for the use of the defense committee is a gift from Mr. Dempsey and is the result of a thorough study of the experience of the railroads in transporting troops and supplies during the Mexican movement and the preparations for handling military traffic during the present emergency. It is said for the new secret code that a message of one or two code words will convey the necessary information for the proper routing of troops or supply trains over six railroads at the same time naming the number of cars involved and whether they are passenger or freight equipment or mixed. The addition of two code words to the message will give to the receiver the actual time to the minute when the train is scheduled to leave the point of origin and arrive at the destination. The code will be in use on all railroads which are members of the American Railway Association, at every point of mobilization and concentration of troops, as well as at the headquarters of the special committee on National Defense of the A. R. A. at Washington.

As an example of the saving that will be effected in the special committee headquarters at Washington, it is asserted that whereas formerly 10 daily reports from each concentration camp were handled in messages of from 20 to 70 code words as well as additional English words, they are now handled in messages of less than 10 words, including both code and other words. As an example of the information included in these reports, one daily message from each concentration camp includes the number of troops and officers there, the number to be moved, their destination, the time and kind of movement, the route, the cars available on the nearest railway, the cars required for the movement, giving the number of each kind, i. e., tourist, standard sleeper, coach, baggage, kitchen, gondola, box, flat, tank and stock.

The nature of the code is, of course, a matter of secrecy, but it is believed that it is similar to Dempsey's standard code tables previously described.

This code was adopted for use in the general passenger department of the New York Central lines on April 15, and according to reports, has been giving satisfactory results. The department is now handling 3,000 messages in and out of Chicago every day and so far, it is asserted, no errors have been made under the new code which have so changed the meaning of a message as to necessitate its repetition. Formerly at least one per cent of all messages had to be resent on account of errors, even when they were telegraphed in direct English. It is said that a two days' study of commercial messages sent from Chicago and New York for sleeping car reservations on the New York Central showed a saving of 74.4 per cent by the application of the Dempsey code.

DIVISIONAL ORGANIZATION OF THE NEW HAVEN

Heretofore the New York, New Haven & Hartford has had a form of divisional organization, but it has now put into effect a divisional organization in which the general principles of this form are more strictly applied. The Central New England and the New Haven are treated as one system. The office of vice-president in charge of operation has been abolished; the general manager and the chief engineer report direct to the president, as do also the general purchasing agent and general storekeeper.

In place of two grand divisions there are now three grand divisions. The lines east, which include all lines east of New London and Willimantic, correspond to the old eastern grand division; the lines west include all the lines west of New London and Willimantic north of the present New York division, and also that division as far as Devon, Conn., 12 miles west of New Haven. The New York division, which is now the third grand division, includes the line west of Devon, including New York terminals and the New York Connecting Railroad, which runs over the Hell Gate bridge to Long Island. The Central New England is in charge of a general superintendent and all four of the general superintendents report to the general manager. The division superintendents report to the general superintendents. Reporting to each one of the general superintendents is a mechanical superintendent and an engineer of lines. Reporting to each division superintendent is a division engineer, a master mechanic and trainmasters.

Reporting direct to the general manager are the general superintendents, the general mechanical superintendent, the signal engineer, the superintendent of transportation, the superintendent of telegraph and the engineer of maintenance of way. As to standards, the mechanical officers report to their superior mechanical officers, and as to standards of maintenance, engineering officers report to their superior engineering officer, as in any strictly divisional organization. The names of the officers under the new organization are given in the news columns of this issue.

IMPORTANT RAILWAY LINK WITH PANAMA.—There are but six breaks in the railroad chain that will soon unite Panama with the United States. Present progress in survey and construction has created the belief that a railroad from the United States to Panama, long recognized by experts as one of our greatest military necessities, will be completed within three or four years. With the exception of the Panama Railroad, owned by the government, these lines are largely owned and controlled by American capital.

RUSSIAN RAILWAY CONGESTION AND COAL OUTPUT.—The congested condition of the Russian railways was an important obstacle in the coal industry. The railways were not always able to move the output of the mines, and as a result there were periods in the latter part of 1915 and beginning of 1916 when large stocks of coal were available at the sources of supply. These stocks, in December, 1915, amounted to 3,069,600 tons, compared with 550,000 to 800,000 tons in normal times.

General News Department

The hearing on the Interstate Commerce Commission's tentative report on the valuation of the Kansas City Southern set for May 23 at Kansas City has been postponed to a date to be determined later.

The Delaware, Lackawanna & Western has advanced the pay of several thousand employees, largely clerks, at rates varying from five to ten per cent. In the cases of large numbers the rate of increase is six per cent.

The Atchison, Topeka & Santa Fe reports that 263 of its employees from all branches of railway service have already enlisted in the regular army, the national guard, the navy, the marines and the signal, aviation, engineers, and reserve corps.

The Chicago, Burlington & Quincy has granted a 10 per cent increase in pay to all shop men and "unorganized" employees on the road. The increase for the shop and clerical men took effect on May 16, and the track laborers' advance dates back to April 18.

In a cablegram to Henry P. Davison, H. H. Harjes, of Morgan, Harjes & Co., of Paris, advises that next to motor cars for ambulances, what are most needed for Red Cross work in France are five sanitary (Red Cross) trains and corresponding staffs of doctors and nurses.

Senator Weeks, of Massachusetts, has introduced in Congress a bill providing that the United States Government shall acquire the Cape Cod Canal, on the ground of military necessity. The canal is only 20 ft. deep, and Senator Weeks says that it should be deepened to accommodate battleships.

Robert S. Lovett, chairman of the executive committee of the Union Pacific, has volunteered to devote practically all of his time during the war to the Red Cross. Henry P. Davison, chairman of the war council of the American Red Cross, has announced that Judge Lovett's services would be accepted at once and that he would be offered the chairmanship of a national committee on co-operation to prevent waste and duplication of work in the activities of the organization.

The United States Civil Service Commission announces examinations, to be held June 20, in all parts of the country for the position of passenger rate clerk, men only, at $100 a month. Applicants must be 20 years old or older. The vacant positions are in the department of the quartermaster of the army at Washington, St. Louis and elsewhere. Applicants must have had experience in a general passenger office, a ticket auditing office, or as rate clerk in a large ticket office for at least two years.

The sub-committee on mediation and conciliation of the Council of National Defense has announced plans for creating nation-wide machinery to aid in mediating labor disputes during the war. Committees of influential employers and labor representatives will be formed in the large industrial centers, beginning with a score of large cities, to co-operate with federal or state mediators, particularly by influencing employers and labor organization leaders to submit questions to arbitration. The committees will be named by the sub-committee on mediation, of which V. Everit Macy, of New York, is chairman, and ratified by Samuel Gompers, chairman of the labor committee of the Council of National Defense.

Senator Joseph E. Ransdell of Louisiana and William Denman, chairman of the United States Shipping Board, held a conference with President Wilson at the White House on Monday, at which Senator Ransdell, who is chairman of the National Rivers and Harbors Congress, urged the substitution of water transportation and of partial water and rail transportation for much of the freight now handled by railroad routes for the purpose of increasing transportation efficiency during the war. Senator Ransdell told the President that if certain work already authorized on the improvement of inland waterways is expedited many of these waterways could be used to a great extent to relieve the present congestion of railway facilities. He also urged that the army concentration camps be located with reference to water routes.

Canada Tears Up Rails

To supply steel rails for the railroads on the west front in France, the Canadian Government has stripped 135 miles of the Grand Trunk Pacific and 75 miles of the Canadian Northern, west of Edmonton, where these roads parallel. Government engineers have inspected these roads and have so arranged that all the towns and mines have still adequate transportation facilities. The rails being sent to France are all from the Grand Trunk Pacific. Those from the Canadian Northern have been transferred to the Grand Trunk Pacific.

The first rails sent across in February last were taken from the National Transcontinental. The second request carried with it a condition that the same standard rails be sent forward. These were only available either on the Transcontinental or Grand Trunk Pacific. For this reason the Canadian Northern rails were transferred to the Grand Trunk Pacific to release those to meet the requirements of the Allied armies.

A Defense of the Grand Trunk

E. J. Chamberlin, president of the Grand Trunk, has issued a statement taking exception to numerous expressions of fact or opinion in the recent report of Messrs. Drayton and Acworth reviewing the general railway situation in Canada.

The first part of Mr. Chamberlin's statement deals with traffic and earnings, showing that the Grand Trunk has done and is doing a large business. The number of cars, passenger and freight, and of locomotives, owned by the road, is compared with similar figures for the other roads in Canada and for three prominent roads of the United States. This is followed by a statement of the number of loaded cars moved in a series of years, this to show that the Grand Trunk has not failed to maintain its facilities for doing business.

The statement furnished by the road to the investigators contained figures showing "deferred expenditures"; and these it is declared are wrongfully treated in the special report as "deferred maintenance." Moreover, the figures applying to Grand Trunk lines outside of Canada (in the United States) are wrongfully included. Of a sum of about $9,000,000, estimated as necessary for rebuilding and re-enforcing freight cars, about $7,600,000 should be charged to additions and betterments, not to the maintenance account, for the contemplated expenditures were for steel underframes, outside metal roofs, friction draft gear and other improvements. Expenditures for tie plates and a number of other items are declared to be betterment expenditures, and not to be included in estimating the sum needed for maintenance. About 23½ millions have been spent in recent years for new locomotives, cars and other improvements, an expenditure which the special report has ignored.

Going somewhat into details, and referring to the large sums named by the investigators under the head of important necessary expenditures now needing to be attended to, the report says:

"The statement in its reference to necessary capital expenditures makes no mention that these estimates were for expenditures required to meet the growing business of the railway and as a protection for the future. As to the item of block signaling, $3,533,000, the question may well be asked, how many miles of railway in Canada are operated today under automatic block signals; and yet this was the estimate for installing such signals upon the entire double track main line of the Grand Trunk Railway of Canada.

"Another item in the statement was $467,500 for the installation of a rock ballast crushing plant: How many miles of railway in Canada, with the exception of the Michigan Central, are at this time ballasted with crushed rock, and what railway would be justified in expending such a large amount of capital as would

be required to ballast its line with rock ballast at this time? The item was only one of several others to which consideration has been given for future development.

"The Grand Trunk Railway System will bear favorable comparison with any railway, either in Canada or the United States, in respect to its physical condition, its maintenance of equipment or its efficiency of operation."

Daylight Saving Bill

The Senate Committee on Interstate Commerce has ordered a favorable report on the bill, introduced by Senator Calder, of New York, providing that clocks shall be moved ahead one hour during the summer months, from the last Sunday in April until the last in September. The Interstate Commerce Commission would be empowered to define five time zones with reference to the requirements of railroads and commercial interests.

Marcus M. Marks, of New York City, president of the Borough of Manhattan and president of the National Daylight Saving Association, went to Washington last Monday and asked President Wilson to include in his legislative war programme the Daylight Saving bill; and it is reported that the President looks upon the proposal with favor. Mr. Marks says that the American Federation of Labor and representatives of many of the leading manufacturers are supporting the measure. Governor S. W. McCall of Massachusetts has approved a resolution passed by the Massachusetts Committee on Public Safety, calling for the daylight saving plan as a war measure.

In the hearing before the Senate committee, representatives of the Detroit Chamber of Commerce declared that while the city of Detroit worked on a time standard different from that of the railroads, nevertheless, despite the inconvenience this naturally caused, the voters recently voted overwhelmingly to retain the idea of setting the clock forward one hour. Sydney Colgate said that Colgate & Co., soap makers, Jersey City, N. J., had run their shops on a daylight saving schedule for several years and that the results had been very satisfactory.

American Gear Manufacturers' Association Convention

The recently organized American Gear Manufacturers' Association held its first convention at the Hotel Schenley, Pittsburgh, Pa., on May 14 and 15. This association has been organized for the purpose of developing, standardizing and improving all products of the gear industry.

The convention was opened Monday, May 14, by F. W. Sinram, president, and the morning devoted to an executive session. In the afternoon, S. L. Nicholson, sales manager of the Westinghouse Electric & Manufacturing Company, spoke on "The Ins and Outs of An Industrial Organization," and James E. Gleason presented a paper on "The Spiral or Curved Tooth Bevel Gear." On the following morning papers were presented by Frank Burgess on "Job Gearing—To What Extent Can It Be Standardized," and by William Ganschow on "Advantages of Gear Standardization." In the afternoon, George L. Markland discussed the "Difficulties of Gear Standardization."

Electric Power Club

The Electric Power Club will hold its annual meeting at the New Willard Hotel, Washington, D. C., on June 11 and 12, instead of at Hot Springs, Va., as was previously announced. The second day will be devoted to the discussion of topics of special interest to executive members. Howard Coffin will give an address on general manufacturing problems in connection with the present national emergency. There will be a paper by Mr. Patterson on "Uniform Cost Accounting" and possibly a talk by a representative of the Federal Trade Commission. It is also possible that there will be some matters that the army and navy departments may wish to present.

Society of Terminal Engineers

The first regular meeting of the recently organized Society of Terminal Engineers will be held in New York, in the United Engineering Society building, 29 West Thirty-ninth street, on Tuesday evening, May 29, at 8 o'clock. The meeting is expected to be an interesting one. Special papers on terminal engineering and mechanical freight and material handling will be read. Special committees will be appointed and a program adopted for the future work of the society. The secretary is J. H. Leonard, 1133 Broadway, New York.

Western Railway Club

At the annual meeting of the Western Railway Club, held on May 21 at the Hotel Sherman, Chicago, the following officers were elected: President, A. R. Kipp, mechanical superintendent Chicago division, Soo Line; first vice-president, A. LaMar, master mechanic, Pennsylvania Lines; second vice-president, G. S. Goodwin, mechanical engineer, Chicago, Rock Island & Pacific; secretary and treasurer, Joseph W. Taylor.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, July 18, 1917, Asheville, N. C.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 8-10, Minneapolis, Minn.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Next annual meeting, June 26-29, Hotel Traymore, Atlantic City, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3rd Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, Chicago, Ill.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION.—Frederick R. Fenton, 111 W. Monroe St., Chicago. Annual convention October 1-3, 1917, Baltimore, Md.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August. Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next meeting, June 12-13, Hotel McAlpin, N. Y.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, Fresno, Cal.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

THREE MONTHS OF CALENDAR YEAR, 1917

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Alabama Great Southern	312	$1,042,226	$337,017	$1,508,441	$188,992	$313,950	$53,073	$484,304	$7,681	$34,636	$1,082,636	$425,805	$58,585	$367,194	—$18,376
Alabama & Vicksburg	143	337,351	103,208	490,616	64,761	78,903	14,908	169,657	5,943	19,782	353,954	136,662	30,200	106,462	31,484
Ann Arbor	294	466,283	115,453	620,486	56,077	123,751	16,270	327,832	959	26,131	551,020	69,466	39,300	30,053	—126,589
Atchison, Topeka & Santa Fe	8,648	22,549,260	7,206,393	32,225,869	3,032,787	5,296,095	538,096	9,912,163	78,533	632,481	19,398,463	12,827,406	1,561,710	11,262,525	2,818,452
Atlanta & West Point	93	207,469	142,336	400,842	44,519	65,701	21,980	129,760	7,808	14,862	284,630	116,212	21,585	94,498	22,205
Atlantic & St. Lawrence	167	395,542	56,860	498,641	79,090	86,814	12,730	357,649	.....	23,158	559,440	—60,799	32,163	—92,962	—173,523
Atlantic City	170	220,905	188,777	444,731	80,156	50,928	11,174	313,572	287	2,330	458,267	—13,536	30,000	—43,612	—2,092
Atlantic Coast Line	4,776	7,383,971	3,193,601	11,550,091	1,204,963	1,566,140	206,260	3,567,013	63,984	243,305	6,841,382	4,708,708	551,000	4,154,634	678,823
Baltimore & Ohio	4,545	22,020,580	3,708,637	28,130,774	2,918,733	5,705,983	564,452	12,061,116	204,601	740,639	22,191,659	5,939,115	1,013,257	4,924,334	—286,983
Baltimore, Chesapeake & Atlantic	88	124,606	49,491	182,980	18,339	34,968	3,754	124,831	.....	8,580	190,473	—7,493	6,873	—14,366	—15,020
Bangor & Aroostook	632	1,010,252	172,044	1,239,594	161,604	186,653	11,432	428,562	11,347	37,069	836,666	402,928	45,000	357,925	—12,783
Belt Ry. Co. of Chicago	31	.....	.....	852,994	53,718	126,035	3,985	483,205	.....	20,144	687,087	165,907	41,061	124,847	—42,244
Bingham & Garfield	36	638,564	18,012	663,702	60,267	87,992	3,962	111,304	201	10,069	273,795	389,907	34,290	355,617	63,146
Boston & Maine	2,306	8,054,172	3,689,614	13,254,745	1,385,101	2,007,804	96,379	7,231,618	61,904	345,911	11,128,716	2,126,029	513,531	1,612,498	—1,175,675
Canadian Pacific Lines in Maine	234	843,989	43,138	917,810	52,036	123,283	17,233	392,295	.....	16,196	601,043	316,766	16,500	300,266	—2,958
Carolina, Clinchfield & Ohio	283	848,862	57,986	928,893	83,069	144,874	49,553	205,156	.....	38,163	519,596	409,297	40,200	369,091	20,836
Carolina, Clinchfield & Ohio of S. C	18	43,577	3,754	49,151	5,175	295	7,328	9,501	.....	2,782	25,082	24,069	1,800	22,262	—1,131
Central of New Jersey	684	6,175,948	1,367,565	8,243,842	649,035	1,589,988	88,535	3,276,326	48,141	192,082	5,843,363	2,400,479	467,820	1,932,593	—177,617
Central New England	301	1,061,976	85,259	1,210,417	212,280	141,028	3,432	474,338	550	23,752	855,346	355,071	53,600	301,414	—2,106
Central Vermont	411	630,454	207,941	944,073	100,715	155,644	22,701	523,964	7,127	30,339	840,489	103,584	46,695	56,739	—139,566
Charleston & Western Carolina	343	420,208	88,265	532,231	89,146	67,738	12,823	190,654	.....	11,254	371,386	160,846	19,500	141,272	—16,152
Chesapeake & Ohio Lines	2,380	10,033,584	1,487,936	12,365,846	1,484,731	2,441,640	175,628	4,121,778	87,002	271,042	8,577,105	3,788,741	403,500	3,383,939	—27,131
Chicago & Eastern Illinois	1,131	3,632,174	783,396	4,822,203	435,358	1,259,464	79,990	1,863,092	33,027	116,402	3,774,193	1,048,010	186,000	861,319	57,504
Chicago & Erie	270	1,585,380	123,063	1,869,429	167,216	266,073	56,455	922,926	9,977	53,015	1,470,504	398,925	93,825	305,100	—330,504
Chicago, Burlington & Quincy	9,373	20,154,578	5,160,514	27,875,409	2,317,344	4,335,592	398,102	9,478,864	362,425	633,605	17,525,932	10,349,477	1,265,033	9,084,444	1,913
Chicago, Detroit & Can. Gd. Trk. Jctn	60	172,265	47,675	281,250	23,310	46,817	4,446	163,138	.....	5,335	243,046	38,204	10,638	27,552	—41,995
Chicago, Indianapolis & Louisville	634	1,510,903	442,775	2,129,227	204,193	400,363	61,855	816,107	1,324	57,053	1,539,094	590,133	97,409	492,580	—20,303
Chicago, Milwaukee & St. Paul	10,222	16,573,210	4,222,281	23,622,970	2,005,822	4,612,345	451,194	11,132,135	182,783	494,527	18,613,175	5,009,796	1,382,471	3,618,051	—2,280,087
Chicago, Rock Island & Gulf	477	668,109	192,673	924,528	129,010	138,403	29,825	305,411	3,685	27,743	634,039	290,489	30,000	260,447	70,600
Chicago, Rock Island & Pacific	7,656	13,364,292	4,657,122	19,641,187	2,496,107	3,780,866	411,011	8,024,615	130,068	499,028	15,254,904	4,386,283	939,756	3,444,633	—644,914
Chicago, St. Paul, Minn. & Omaha	1,753	2,954,754	1,188,996	4,527,558	506,427	712,589	91,016	2,035,735	48,184	134,207	3,526,030	1,001,528	264,100	736,534	—445,141
Cincinnati, Indianapolis & Western	322	495,161	125,055	681,033	61,150	103,092	22,166	293,128	1,461	22,501	503,403	177,631	28,498	149,132	58,343
Cincinnati, New Orleans & Tex. Pacific	337	2,103,759	672,294	2,988,979	287,435	653,065	87,556	968,886	32,987	59,941	2,089,870	899,109	113,400	785,697	—48,577
Cincinnati Northern	246	464,877	43,919	523,982	77,028	96,343	9,656	236,852	.....	10,022	429,110	94,872	21,000	73,871	—41,880
Cleveland, Cincinnati, Chic. & St. L	2,387	8,030,200	2,388,236	11,438,068	985,191	2,200,590	257,784	5,077,687	74,802	254,659	8,844,146	2,593,922	480,000	2,112,339	—964,769
Colorado Midland	338	260,100	29,026	315,057	43,644	97,574	19,710	159,455	1,876	15,347	337,605	—22,549	27,000	—49,549	—37,398
Colorado & Southern	1,103	2,012,783	340,722	2,557,603	211,039	410,172	28,993	734,792	13,928	75,540	1,474,464	1,083,139	134,139	948,178	342,402
Cripple Creek & Colorado Springs	87	284,262	35,090	325,375	31,392	38,125	4,355	76,467	.....	9,058	159,397	165,978	9,000	156,978	5,405
Cumberland Valley	164	813,446	159,107	1,022,149	69,821	98,191	12,883	344,449	2,834	30,177	554,512	465,637	30,041	437,596	6,885
Delaware & Hudson Co.—R. R. Dept	886	5,463,760	581,381	6,377,598	595,311	1,522,030	76,515	2,769,916	53,708	244,515	5,258,791	1,118,807	186,600	929,869	—905,173
Denver & Rio Grande	2,578	4,970,981	837,181	6,229,352	592,595	1,195,962	117,508	2,005,835	78,416	202,529	4,190,281	2,039,071	275,000	1,763,507	—8,855
Denver & Salt Lake	255	316,679	47,411	378,540	77,698	131,788	5,540	224,394	.....	15,559	454,970	—76,430	24,750	—101,185	—115,689
Detroit & Mackinac	383	194,192	70,978	287,925	33,795	73,551	5,968	112,166	.....	10,679	236,159	51,767	24,065	27,702	—25,206
Detroit & Toledo Shore Line	81	460,992	.....	470,132	23,865	29,234	4,989	140,916	.....	9,662	208,666	261,467	21,240	240,227	—53,301
Detroit, Grand Haven & Milwaukee	191	484,000	123,500	715,681	76,281	113,348	15,839	474,745	244	18,126	698,583	17,098	10,860	5,653	—58,384
Detroit, Toledo & Ironton	441	549,453	35,434	627,633	52,801	84,110	12,466	393,993	.....	23,568	566,939	60,695	24,000	36,408	—55,204
Duluth, South Shore & Atlantic	600	657,460	197,015	906,530	132,644	128,073	21,889	386,673	11,012	26,034	706,326	200,204	54,000	146,191	30,848
Duluth, Winnipeg & Pacific	191	494,308	82,435	588,910	34,977	77,036	6,360	242,057	3,829	19,128	383,386	205,523	29,427	176,096	10,326
El Paso & Southwestern Co	1,028	2,843,975	611,034	3,637,816	329,142	401,615	63,543	904,555	21,159	83,024	1,803,037	1,834,778	115,928	1,718,837	652,009
Erie	1,988	11,086,565	2,113,370	14,855,222	1,401,721	4,200,704	284,424	7,565,994	107,391	370,374	13,924,353	930,869	673,455	253,819	—2,689,055
Florida East Coast	765	1,022,086	1,155,635	2,573,582	210,684	231,805	33,560	609,117	20,531	49,216	1,147,463	1,426,118	105,640	1,320,411	32,217
Fort Worth & Denver City	454	1,048,620	350,169	1,497,306	164,734	247,716	20,121	434,241	7,481	52,753	927,046	570,261	52,500	517,693	23,582
Galveston, Harrisburgh & San Antonio	1,361	3,278,551	1,099,106	4,649,821	601,145	627,688	106,915	1,582,271	38,799	120,383	3,055,889	1,593,932	158,251	1,433,672	1,033,891
Galveston Wharf Co	14	.....	.....	335,175	4,539	4,045	897	99,820	67,631	2,017	178,949	156,226	31,500	124,726	—10,981
Georgia	307	581,628	210,774	862,155	83,124	132,951	39,814	359,308	388	28,909	644,317	217,838	16,745	201,089	1,753
Grand Canyon	64	1,218	70,562	115,490	29,195	4,590	2,055	49,437	.....	567	85,830	29,660	4,388	25,272	—72,990
Grand Rapids & Indiana	575	1,018,520	329,970	1,468,819	195,533	269,100	27,857	725,264	1,111	56,196	1,275,061	193,758	66,615	127,126	—29,586
Grand Trunk Western	347	1,481,200	338,000	1,988,169	183,467	419,134	47,904	979,443	18,588	53,882	1,702,419	285,750	111,705	173,717	—352,001
Great Northern	8,195	11,632,912	3,180,647	16,611,370	2,085,866	3,031,094	322,097	6,828,555	248,298	355,168	12,720,601	3,890,768	1,266,619	2,622,725	—707,716
Gulf & Ship Island	308	368,854	84,992	483,115	60,865	69,939	8,951	150,440	1,017	35,024	315,958	167,157	27,311	139,678	—34,170
Gulf, Colorado & Santa Fe	1,937	2,974,932	681,831	3,912,821	697,033	601,145	87,525	1,355,933	.....	162,680	2,901,339	1,011,482	178,448	831,481	117,067
Gulf, Mobile & Northern	402	398,636	75,758	505,060	72,772	83,140	12,282	162,980	27	24,257	355,458	149,602	25,263	124,339	4,605
Hocking Valley	350	1,752,426	208,686	2,050,613	187,753	511,790	26,609	699,170	.....	50,957	1,476,279	574,334	147,000	426,949	175,437
Houston, East & West Texas	191	332,158	84,681	448,445	50,373	53,652	6,497	146,969	2,144	9,788	268,887	179,558	19,443	159,812	71,278
Houston & Texas Central	918	1,266,665	379,006	1,800,063	269,102	230,717	52,500	607,989	13,677	59,024	1,230,632	569,431	97,029	471,605	271,957
International & Great Northern	1,160	1,774,785	596,949	2,587,513	391,984	432,069	69,274	1,076,210	15,647	89,657	2,022,615	564,898	119,638	444,655	121,015
Kansas City, Mexico & Orient of Texas	466	247,708	48,072	313,059	61,797	71,212	11,568	162,034	.....	13,891	320,502	—7,444	15,500	—23,058	681
Kansas City Southern	837	2,498,116	396,616	3,142,429	312,624	396,944	79,831	1,002,022	.....	105,334	1,889,222	1,253,207	174,164	1,077,133	309,296
Lake Erie & Western	900	1,727,645	159,641	1,976,291	186,323	322,181	38,278	783,105	.....	44,885	1,374,773	601,518	77,000	524,290	31,483
Lehigh & Hudson River	97	452,327	11,365	504,327	53,799	87,761	4,203	197,864	.....	13,196	356,823	147,505	16,800	130,705	—14,408
Lehigh & New England	296	729,478	4,346	768,850	101,252	135,177	6,723	241,184	.....	25,695	510,008	258,842	28,005	230,837	—104,801

REVENUES AND EXPENSES OF RAILWAYS

THREE MONTHS OF CALENDAR YEAR, 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Lehigh Valley	1,442	$9,388,622	$957,669	$11,284,987	$1,315,621	$2,110,444	$244,388	$5,545,116	$44,142	$268,632	$9,521,202	$1,763,785	$487,500	$1,275,963	—$1,160,096
Long Island	397	973,893	1,639,955	3,028,826	463,939	421,884	26,631	1,619,146	25,281	115,494	2,670,614	358,213	218,040	140,006	—157,180
Los Angeles & Salt Lake	1,154	1,837,142	719,244	2,811,619	311,429	461,593	98,995	871,723	58,402	71,171	1,856,834	954,785	158,699	795,730	31,973
Louisiana Ry. & Navigation Co	342	450,908	72,934	562,637	85,092	66,588	19,174	214,255	.....	21,224	406,334	156,303	43,500	112,584	22,184
Louisville & Nashville	5,070	12,638,404	3,430,471	17,258,904	2,041,192	3,146,234	401,118	5,568,662	106,792	350,512	11,512,138	5,746,766	792,127	4,951,700	205,498
Louisville, Henderson & St. Louis	200	379,744	97,711	507,468	66,157	53,680	14,579	165,884	.....	11,074	311,375	196,093	11,900	183,963	65,378
Midland Valley	385	459,820	130,659	615,555	120,747	105,015	8,435	204,554	.....	26,528	465,280	150,276	15,413	134,681	61,770
Mineral Range	120	281,487	8,540	296,242	60,515	60,677	1,339	161,485	.....	3,292	287,308	8,934	9,000	—66	12,534
Minneapolis & St. Louis	1,647	1,827,169	408,637	2,415,661	325,478	277,172	54,908	1,045,024	259	67,058	1,769,662	645,999	130,883	514,979	—247,092
Minn., St. Paul & S. S. Marie	4,228	4,810,775	1,456,259	6,881,687	675,230	1,101,788	143,332	2,787,075	47,818	201,239	4,922,288	1,959,399	303,193	1,656,206	—1,348,408
Missouri & North Arkansas	365	238,114	92,964	354,861	62,862	49,356	11,942	126,753	.....	15,112	265,984	88,877	14,400	74,150	102,098
Missouri, Kansas & Texas System	3,865	6,662,245	2,209,091	9,626,787	1,994,812	1,859,460	197,258	3,777,742	66,228	318,623	8,213,904	1,412,883	387,164	1,021,432	873,027
Missouri, Oklahoma & Gulf	334	376,527	61,651	457,764	58,377	83,965	13,651	224,060	956	22,468	403,476	54,288	25,823	28,460	85,196
Missouri, Oklahoma & Gulf of Texas	134	72,200	1,241	74,782	9,793	7,766	5,509	33,756	.....	5,366	62,190	12,592	551	12,032	15,617
Missouri Pacific	3,756	6,374,652	1,160,351	8,245,053	1,247,519	1,423,043	200,074	3,277,920	22,434	191,806	6,331,063	1,913,990	371,000	1,539,059	305,213
Mobile & Ohio	1,160	2,601,753	342,258	3,127,923	365,984	677,302	116,878	1,073,728	7,434	94,168	2,335,493	792,431	124,618	667,124	14,230
Monongahela	108	456,790	30,485	496,260	72,774	41,463	2,473	129,570	.....	11,759	258,040	238,220	18,000	220,220	—26,128
Monogahela Connecting	6	.....	.....	524,091	97,574	65,415	1,018	199,863	.....	11,978	375,849	148,242	5,235	142,918	121,087
Nashville, Chattanooga & St. Louis	1,237	2,367,798	751,132	3,473,549	359,980	652,645	162,399	1,366,075	42,880	109,613	2,692,309	781,240	90,000	689,912	9,751
Nevada Northern	165	492,901	35,348	540,672	48,491	53,114	2,297	102,067	286	14,284	220,539	320,133	24,000	296,132	42,882
New Orleans & North Eastern	204	831,238	155,062	1,116,625	109,839	192,682	33,651	355,631	21,195	36,532	749,526	367,100	58,800	308,300	56,897
New York Central Railroad	6,083	32,302,443	12,069,023	51,576,503	5,206,282	9,914,511	779,185	22,341,281	799,821	1,302,440	40,343,521	11,232,982	2,729,808	8,492,159	—6,379,129
New York, New Haven & Hartford	1,988	9,435,329	7,299,057	19,360,413	1,667,321	2,773,438	110,418	8,728,598	293,744	577,196	14,148,144	5,212,269	828,000	4,383,194	426,237
New York, Ontario & Western	568	1,358,638	217,400	1,879,976	185,053	363,564	25,918	892,003	.....	58,262	1,524,800	355,176	54,000	301,174	—81,387
New York, Philadelphia & Norfolk	112	911,056	115,991	1,111,700	135,999	223,233	14,125	477,469	15,255	39,339	905,392	206,308	40,500	165,494	—132,936
New York, Susquehanna & Western	135	625,772	141,699	858,582	71,136	99,704	5,466	488,918	.....	16,590	681,087	177,495	48,500	128,835	—123,235
Norfolk & Western	2,085	12,740,484	1,306,074	14,608,612	1,319,636	2,654,296	192,470	4,241,778	29,212	277,759	8,694,845	5,913,767	710,000	5,203,256	—559,053
Northwestern Pacific	507	453,336	353,166	908,905	186,579	142,293	13,838	363,563	2,526	33,417	739,894	169,011	55,168	113,823	69,148
Oahu Railway & Land Co	114	201,308	66,150	296,185	35,665	26,570	2,741	80,566	.....	14,388	159,899	136,287	28,708	107,578	7,767
Oregon Short Line	2,307	4,627,244	1,126,084	6,240,315	681,578	789,457	109,655	1,859,626	110,031	232,831	3,778,725	2,461,590	430,230	2,029,891	—77,234
Oregon-Washington R. R. & Nav. Co	2,052	2,889,733	1,047,256	4,305,841	675,891	526,800	137,277	1,593,908	60,648	228,436	3,216,107	1,089,734	298,800	790,576	424,020
Panhandle & Santa Fe	670	1,223,095	250,199	1,541,725	200,205	268,491	12,723	409,670	.....	36,571	927,294	614,431	42,040	572,148	59,592
Pennsylvania Company	1,755	11,079,994	2,943,389	15,690,033	2,017,351	3,360,493	254,370	8,332,091	132,947	456,914	14,545,906	1,144,127	1,045,112	98,865	—3,426,395
Pennsylvania Railroad	4,536	40,647,851	10,943,085	59,404,698	7,512,539	12,114,178	642,375	23,972,397	939,823	549,287	46,714,270	10,690,428	2,252,231	8,432,098	—2,587,908
Pere Marquette	2,249	3,747,114	932,306	5,275,208	376,999	1,374,284	107,056	2,674,752	13,535	155,021	4,699,998	575,210	113,859	457,815	—875,407
Philadelphia & Reading	1,127	12,677,499	1,675,420	15,421,834	841,374	2,626,773	138,352	6,575,606	39,955	265,502	10,479,358	4,942,476	414,582	4,525,518	—1,504,863
Philadelphia, Baltimore & Washington	718	3,221,322	2,783,329	6,655,739	937,897	1,323,656	87,218	3,016,141	575	168,404	5,527,490	1,128,249	190,858	937,342	—178,513
Pittsburgh & Lake Erie	225	4,525,168	492,590	5,543,219	677,041	1,167,769	48,183	1,856,813	15,405	113,955	3,879,167	1,664,052	255,600	1,408,452	—1,298,696
Pittsburgh, Cincinnati, Chic. & St. L	2,399	11,851,899	2,979,070	16,757,662	1,949,631	3,451,367	298,299	7,254,003	149,173	433,553	13,532,862	3,224,800	697,405	2,526,986	—655,963
Pittsburgh, Shawmut & Northern	205	325,012	16,723	349,206	39,278	151,359	3,586	136,422	.....	13,465	344,111	5,096	5,400	—304	—143,128
Port Reading	21	386,910	.....	445,950	24,447	30,326	117	291,354	.....	1,833	347,963	97,987	30,000	67,987	8,316
Richmond, Fredericksburg & Potomac	88	533,875	433,886	1,109,548	88,230	117,288	11,886	383,937	12,722	26,123	640,186	469,362	34,714	434,582	37,799
Rutland	468	566,494	270,629	962,453	113,608	180,133	26,213	413,190	3,352	21,908	758,404	204,049	54,244	149,804	—22,309
St. Joseph & Grand Island	258	423,052	71,031	525,158	129,914	65,494	12,819	193,835	543	14,923	417,529	107,629	26,489	81,011	—6,481
St. Louis, Brownsville & Mexico	548	580,489	438,640	1,090,382	153,549	117,483	28,535	316,499	.....	32,738	642,876	447,506	24,000	423,500	339,373
St. Louis, Iron Mountain & Southern	3,539	7,214,579	1,955,631	9,982,130	1,404,523	1,569,798	225,900	3,038,470	34,711	202,787	6,460,927	3,521,202	459,390	3,056,842	1,589,629
St. Louis, San Francisco & Texas	244	187,544	76,355	295,553	44,608	53,109	6,335	130,790	.....	19,386	254,229	41,324	4,474	36,843	37,745
St. Louis Southwestern	94	2,223,515	396,041	2,759,665	231,325	440,290	96,458	652,248	7,141	81,898	1,508,844	1,250,821	102,147	1,148,526	464,510
St. Louis Southwestern of Texas	811	892,440	238,383	1,227,132	200,916	310,072	41,432	552,618	3,179	59,355	1,165,145	61,987	54,241	7,589	115,169
San Antonio & Aransas Pass	726	585,054	201,599	862,654	212,561	160,680	20,046	441,850	.....	43,100	875,593	—12,940	45,000	—58,045	44,037
Seaboard	3,461	5,211,560	1,810,031	7,804,053	793,273	1,122,709	253,629	2,814,082	69,449	202,491	5,246,112	2,557,940	317,489	2,237,769	48,316
Southern	6,983	13,469,956	4,546,133	19,869,122	2,369,066	3,087,663	502,362	6,983,441	154,718	561,380	13,574,099	6,295,025	856,432	5,429,441	300,583
Southern in Mississippi	281	162,334	90,018	281,500	75,715	27,245	7,359	129,615	.....	14,593	254,527	26,973	28,660	—1,712	—6,822
Spokane, Portland & Seattle	555	976,390	319,331	1,386,685	134,382	122,291	22,143	304,786	12,639	41,559	636,952	749,733	173,190	576,308	326,576
Tennessee Central	295	281,945	85,052	401,622	69,536	63,298	16,505	154,767	.....	19,960	324,066	77,556	14,400	63,156	23,359
Texas & New Orleans	468	1,011,215	325,329	1,469,950	159,178	238,058	28,552	472,536	40,730	35,066	973,983	495,967	64,811	430,106	316,111
Toledo & Ohio Central	436	1,303,484	139,195	1,509,026	204,520	349,074	21,286	716,997	5,156	31,447	1,328,481	180,545	75,445	105,072	137,023
Toledo, Peoria & Western	248	174,851	101,989	296,354	49,583	80,997	7,192	121,261	.....	14,186	273,186	23,156	22,500	656	—5,914
Toledo, St. Louis & Western	451	1,364,726	84,268	1,525,928	263,290	270,470	54,418	549,980	.....	27,784	1,165,454	360,474	57,000	303,474	—121,200
Ulster & Delaware	129	74,220	35,479	160,629	23,407	32,735	3,687	84,151	1,164	10,924	156,068	4,561	12,000	—7,425	—37,486
Union Pacific	3,622	10,714,781	2,532,479	14,783,042	1,833,579	2,249,923	343,599	5,136,620	294,761	518,675	10,341,809	4,441,233	863,800	3,576,276	—2,322,342
Union R. R. of Baltimore	8	380,546	89,853	476,972	23,629	.....	.....	19,977	.....	6,574	50,169	426,802	22,267	404,535	48,223
Vicksburg, Shreveport & Pacific	171	324,966	125,729	519,363	51,541	82,493	13,816	161,393	5,372	16,485	331,100	188,263	32,275	155,988	74,285
Wabash-Pittsburgh Terminal	63	249,080	25,996	298,903	46,708	60,767	6,305	124,173	7,141	12,764	257,859	41,045	23,604	16,071	—32,386
Washington Southern	36	180,552	251,783	564,594	38,411	59,902	4,895	186,452	5,627	11,571	306,858	257,736	14,320	243,394	60,488
West Jersey & Seashore	359	629,632	804,215	1,567,824	365,488	269,324	33,156	839,786	10,413	54,174	1,572,219	—4,395	120,082	—124,540	—151,863
Western Maryland	775	2,682,626	213,100	3,118,688	339,924	515,676	63,661	1,129,624	32,730	83,937	2,165,066	953,622	109,500	844,122	86,495
Western Pacific	958	1,477,235	236,926	1,829,584	271,782	210,851	59,138	624,267	30,234	61,225	1,257,498	572,086	101,043	471,034	101,379
Western Railway of Alabama	133	210,883	129,655	379,902	46,887	72,317	19,614	120,891	6,560	13,045	279,315	100,587	18,191	82,387	26,449
Wichita Valley	257	170,123	51,143	255,516	39,098	16,814	371	69,827	.....	3,771	129,881	125,635	11,450	114,181	21,918

Traffic News

The Boston & Maine announces that passenger service is to be curtailed as much as seems reasonable and practicable; and that the changes to be made will take place on June 25.

Edward A. Niel, coal freight agent of the Buffalo, Rochester & Pittsburgh, was elected president of the Great Lakes Waterways Conference at the annual meeting of that body held in Rochester, N. Y., May 14.

The Chicago office of the Erie has opened a study class for the training of 25 young women in matters relating to traffic, in anticipation of their employment in the tariff department if male employees are drawn into military service.

The Baltimore & Ohio is making studies preparatory to curtailment of passenger train service wherever practicable. O. P. McCarty, passenger traffic manager, intends to give early notice of any proposed changes, and he will endeavor to confer in advance with interested communities.

Additional state commissions have adopted for application to intrastate traffic the Interstate Commerce Commission tariff of demurrage rates. The new rules go into effect in Missouri on June 1, and have been effective in Arkansas since May 9, and in Wyoming since May 10. The Railroad Commission of Louisiana will hold a hearing on the I. C. C. rules on June 4.

The hearing on new reconsignment rules before C. V. Burnside, attorney examiner of the Interstate Commerce Commission, which was begun at Chicago, on May 7, was adjourned on May 19, until June 14, when it will be resumed at Chicago. Another hearing will be held at Washington, beginning June 25. Some of the eastern and western carriers have testified, as well as some of the grain, lumber and coal shippers, but the tentative program which provided for hearing each interest in consecutive order was not adhered to.

In response to a request from the executive committee of the Special Committee on national defense of the American Railway Association, the executive committee of the National Industrial Traffic League will meet at Washington this week to consider transportation problems which have arisen as a result of the war, with special reference to co-operative efforts on the part of the league toward increasing the car supply and the efficiency of transportation facilities in general. Fairfax Harrison, chairman of the railways' committee has been invited to be present to explain to the league the plans of the carriers.

In line with the intention of the railroads to file petitions with all state commissions for authority to make a general increase of 15 per cent in freight rates, applications have been made in California, Minnesota, Montana, North Carolina, Utah and Wisconsin, in addition to those already mentioned in these columns. The State Public Utilities Commission of Illinois held a hearing on May 22 on the application of the Illinois railroads. The North Carolina commission will hold a hearing about June 1. The Tennessee railroad commission has received a petition of this nature from the Illinois Central and has entered an order requiring the railroad company to file with the commission, within thirty days, a statement setting forth the value of the property of the company that is devoted to the freight and passenger business interstate and intrastate in Tennessee, and the value of the property devoted to each branch of the service in Tennessee, and to segregate the freight from the passenger business.

Embargoes

The movement of freight traffic throughout the country is considerably freer than during the winter, but is nevertheless characterized by an insufficiency of cars available for loading and by the shifting of congestion from one point to another. Western railroads complain that under the car service rules now in effect the percentage of cars on their lines is steadily being reduced. The Wabash removed restrictions on the movement of l. c. l. freight to or via Toledo on May 15, while the Erie placed an embargo on l. c. l. for delivery at Cleveland on May 17, on account of accumulation at that point. The Cleveland, Cincinnati, Chicago & St. Louis placed similar restrictions on the movement of l. c. l. freight to Cleveland. On May 17, the Baltimore & Ohio removed an embargo on l. c. l. freight to and from connections at Columbus, Ohio. On May 16, the Pennsylvania Railroad cancelled an embargo on freight destined to or via the Long Island Railroad. On May 16, the Baltimore & Ohio removed an embargo on c. l. freight routing via Glenwood, Pa., and destined to or beyond Wheeling, W. Va., and on May 17 placed an embargo on c. l. freight routing from or through Connellsville, Pa., and destined to Fairmont, W. Va., or beyond with the usual exceptions of live stock, perishables, coal, etc., and petroleum.

The Pennsylvania has abolished the low-price reconsignment privilege under which lumber in large quantities for Philadelphia has been shipped from the south to Chester, Pa., 13 miles south of Philadelphia, and then rebilled, thus evading the embargo against Philadelphia.

Reports from Louisville, Ky., say that severe congestion in the yards at Louisville and Cincinnati has necessitated the placing of a number of embargoes on all classes of freight except coal and perishables.

On account of a teamsters' strike in Toronto, the Canadian Pacific and the Grand Trunk on May 17 extended their respective embargoes to cover all l. c. l and team track cartage freight for delivery at stations in Toronto. On May 12 the Canadian government railways placed an embargo on all shipments of plywood, shooks, timber and lumber and all kinds of munitions consigned to or in care of E. H. Harris, or on account of the British imperial government for movement overseas. The embargo was placed on account of an accumulation at the ports and lack of boats.

Illinois Fares 2.4 Cents a Mile

The railroads of Illinois have notified the attorney general of the State that, beginning May 31, their intrastate passenger fares will be advanced to the basis of 2 cents, 4 mills per mile. This action is taken in compliance with the recent order of the United States Court at St. Louis.

Railway Business Association Establishes Committee on Freight Car Thrift

The Committee on Freight Car Thrift of the Railway Business Association has organized with George T. Smith, president of the Joseph Dixon Crucible Company of Jersey City, as chairman. The following acceptances of appointment have been received by President George A. Post:

Samuel M. Curwen, president, J. G. Brill Company, Philadelphia.
C. C. Esdale, manager of operations, Southern Wheel Company, Birmingham, Ala.
Andrew Fletcher, president, American Locomotive Company, New York.
F. H. Gordon, general manager of sales, Lukens Steel Company, Coatesville, Pa.
E. D. Herron, superintendent, American Brake Shoe & Foundry Company, Chattanooga, Tenn.
W. D. Jenkins, New Orleans, La.
Robert P. Lamont, president, American Steel Foundries, Chicago.
Archer A. Landon, vice-president, American Radiator Company, Buffalo.
E. B. Leigh, president, Chicago Railway Equipment Company, Chicago.
A. H. Mulliken, president, Pettibone, Mulliken & Company, Chicago.
E. H. Raymond, secretary, Crane Company, Chicago.
Ed. L. Ryerson, Jr., vice-president, Joseph T. Ryerson & Son, Chicago.
G. W. Simmons, vice-president, Simmons Hardware Company, St. Louis.
Guy E. Tripp, president, Westinghouse Electric & Manufacturing Company, New York.
W. H. Woodin, president, American Car & Foundry Company, New York.

It was decided that the committee should devote itself to stimulating voluntary co-operation by shippers in fuller use of facilities. The committee will co-operate in developing means for enlisting consignors and consignees and in creating and recommending blanks, forms and other instruments for their use. The production and distribution of instruments for instructing employees, recording performance and correspondence with consignors and consignees will be promoted by correspondence and conference with associations in the several branches of trade and with general and local traffic organizations. Where trade organizations do not undertake the production and dissemination of blanks and forms it will be suggested to the railways that they do so.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has vacated its order of May 10, providing for an investigation concerning the propriety and lawfulness of the rates, charges, regulations and practices in connection with refrigerator car service, provided under a new tariff of the New York Central, which the commission had suspended until Septemper 11.

The Interstate Commerce Commission has issued an order authorizing the Southern Pacific to continue the possession and operation of its steamship lines between New York and New Orleans and Galveston in accordance with the application of the company for such permission, under the terms of the Panama Canal act. The commission on January 24 filed a report that under present conditions the extension of the time during which the petitioner may continue to operate its steamship lines will neither exclude, prevent nor reduce competition and that the correction of certain objectionable practices which were enumerated would leave no basis of record to justify the withholding the finding that the service is in the interest of the public. The company by the filing of appropriate tariffs has corrected the objectionable practices referred to.

Cotton to New England Points

Opinion by Commissioner Hall:

Proposed tariff schedules canceling joint rates on cotton and cotton linters, in bales, compressed, from Virginia ports to certain New England and Canadian points, are found not justified. (44, I. C. C., 441.)

Switching Charges at Richmond, Va.

Richmond Chamber of Commerce v. Seaboard Air Line et al. Opinion by Commissioner Daniels:

Upon rehearing in Richmond Chamber of Commerce v. S. A. L. Ry., 30, I. C. C., 552, the commission holds: that the carriers' practice of uniformly absorbing switching charges on carload traffic to or from industries located on the Norfolk & Portsmouth Belt Line at Norfolk, while refusing to absorb switching charges on like traffic at Richmond, is not preferential of Norfolk or unduly prejudicial to Richmond shippers, and that the practice of certain carriers serving Richmond of absorbing switching charges only when the switching line competes with the line-haul carrier, while refusing to absorb such charges when the switching line does not compete with the line-haul carrier, constitutes undue discrimination within section 2 of the act to regulate commerce when the swtching service performed is substantially similar. (44, I. C. C., 455.)

Rates on Potatoes from Wisconsin and Minnesota

Northern Potato Traffic Association v. Chicago & Alton et al. Opinion by Commissioner Clark:

Rates on potatoes, in carloads, from certain producing points in Wisconsin and Minnesota on the Great Northern, Northern Pacific, and Minneapolis, St. Paul & Sault Ste. Marie, to Chicago, St. Louis, Kansas City, Omaha and other points in western trunk line territory, are not found unreasonable.

A rental charge of $5 per car per trip on refrigerator or other insulated cars in the movement of potatoes during the winter season, added to the freight rate from and to the points involved, is not shown to be unreasonable, but found to be prejudicial and preferential. This charge when applied during the summer months is a new charge established in April, 1916, and is not found justified.

The charges for the carriers' protective service and certain rules and regulations governing the transportation of potatoes, in carloads, from and to points involved, are not found unreasonable.

A tariff provision, which seeks to limit the carriers' liability for loss or damage, due to cold or heat, not the direct result of the negligence of the carrier, is not found to be in violation of the Cummins amendment to section 20 of the act. (44, I. C. C., 426.)

Increased Rates Not Allowed

Cincinnati Switching Absorption. Opinion by the commission: A proposed cancellation of absorptions of switching charges which would result in increased rates on grain in carloads originating at, and on coal in carloads destined to, local stations on the Cincinnati, Indianapolis & Western is found not justified. (44 I. C. C., 353.)

Grain to Little Rock. Opinion by the commission: Proposed increased rates on wheat and corn and their products, and on flaxseed, millet seed, and hempseed from points in Oklahoma to Little Rock and other points in Arkansas, are found not justified. (44 I. C. C., 355.)

Fresh Meats from St. Louis, Mo. Opinion by the commission: A proposed cancellation of proportional commodity rate on fresh meats in carloads from St. Louis, Mo., to Fort Worth and North Fort Worth, Tex., applicable on shipments consigned through from New York, N. Y., and Jersey City and Newark, N. J., is found not justified. (44 I. C. C., 365.)

Southwestern Dairy Products. Opinion by Commissioner McChord:

Proposed increased rates on butter, butterine, eggs and dressed poultry in carloads from points in the states of Oklahoma, Arkansas, Texas and Louisiana to points in western trunk line territory, and to St. Louis, Mo.; Chicago; Memphis, Tenn., and other gateways, on traffic to points in central freight association, trunk line, and southeastern territories are found not justified. (44 I. C. C., 379.)

Complaints Dismissed

Wichita Wholesale Furniture Company v. Atchison, Topkea & Santa Fe et al. Opinion by Commissioner Clements:

Rates on furniture in carloads from and through Wichita, Kan., to points in Oklahoma and Texas are not shown to be unreasonable or unjustly discriminatory. (44 I. C. C., 339.)

Board of Trade of the City of Chicago v. Pere Marquette et al. Opinion by Commissioner Clements:

Rates, domestic and export, on grain and grain products from Chicago to points in trunk line territory east of Niagara frontier, are not found unreasonable or prejudicial in comparison with rates lower by one cent per 100 lb. contemporaneously in effect by break-bulk routes from Milwaukee, Manitowoc and Kewaunee, Wis. (44 I. C. C., 345.)

Board of Commerce, Lexington, Ky., v. Cincinnati, New Orleans & Te..as Pacific. Opinion by Commissioner Harlan:

The commission finds that the rates between Cincinnati-Louisville and Lexington, considered as local rates, increased on January 1, 1916, have been justified. Complaint dismissed. (44 I. C. C., 407.)

Revised Rules of Practice

The commission has adopted a new ruling in relation to the filing of informal complaints, rescinding its announcement of April 27, 1916. The period of two years, under section 16, within which complaints for the recovery of damages must be filed, is held to mean two years from the date of the delivery of the shipment. All complaints of this nature must be filed by or on behalf of the party who has borne the transportation charges as such. A notice that a complaint may possibly be filed in the future is not a filing as contemplated by the statute. When a complaint asking reparation is withdrawn from informal consideration it cannot be filed as a formal complaint, except within six months from the date of being taken out of the informal class, this provision applying, however, only when the two-year period, above mentioned, has expired.

Rule 3 of the rules of practice has been amended in the last two paragraphs in accordance with the notice now issued. Where a complaint covers a general scheme of rates and where a large number of shipments may be affected, freight bills and other exhibits bearing on the amount of reparation should not be filed with the complaint, but be reserved until called for.

COURT NEWS

Stop, Look and Listen Rule

The Kansas Supreme Court holds that the rule that it is negligence as a matter of law for the driver of an automobile to attempt to cross a railroad track without stopping, where without doing so he cannot assure himself that no train is approaching, does not apply where, as the automobile approaches the crossing, the train is standing still, the rear car being near the highway, and a collision results from a sudden starting back of the locomotive. Whatever risk he runs is that the engine may suddenly start up; and stopping his own vehicle and going on the track to look would not give him any additional information as to the likelihood of that taking place.—De Hardt v. Atchison, T. & S. F. (Kan.), 163 Pac., 650. Decided March 10, 1917.

Bridge Accident to Pedestrian

In an action for personal injuries to the plaintiff from being knocked down and run over by an engine on a railroad bridge, the Nebraska Supreme Court holds that instructions which permitted a verdict to be rendered against the railroad merely for the reason that the bridge as constructed was not wide enough to permit foot passengers and engines or trains to pass over it at the same time with safety were erroneous. The fact that the railroad suffered or permitted the use of the bridge for foot passengers for many years implied a license to use it, but it did not impose upon it any duty to change the construction of the bridge so as to make it wide enough for trains and passengers to pass over it at the same time. Judgment for the plaintiff was reversed.—Peterson v. C. M. & St. P. (Neb.), 161 N. W., 1,043. Decided March 16, 1917.

Commissioners' Order Not a Rule or Regulation

The Florida Supreme Court holds that section 2908 of the General Statutes of 1906, which authorizes the imposition of a penalty by the railroad commissioners on any railroad . . . for disregard of "any rate, schedule, rule or regulation" prescribed by said commission, does not authorize the commissioners to impose a penalty upon railroad companies for failure to comply with an order for the erection of a union station, on or by a fixed date. While the words "rule," "regulation" and "order" are frequently used as synonyms, they do not aways mean the same thing, and are not interchangeable at will. In determining their exact meaning in a statute, much depends on the context.—Atlantic Coast Line v. State (Fla.), 74 So., 595. Decided March 12, 1917. Rehearing denied March 17, 1917.

Proof of Cause of Nervous Condition

In an action for personal injury claimed to have been sustained by a passenger in a collision, the plaintiff received no bruises, cuts, wounds or broken limbs, but was jostled and thrown backward and forward in his seat. He was afterwards treated for neurasthenia, and he testified that the disease was caused by the accident. The jury evidently relied on his statement as to the nature of the injury and its consequences, and returned a verdict for the plaintiff. The Florida Supreme Court reversed the judgment thereon, holding that it should appear from the evidence with reasonable certainty that the diseased nervous condition resulted from the injury received in the accident, and not be left to speculation and guesswork on the part of the witness materially interested in the recovery of damages.—A. C. L. v. Brash (Fla.), 74 So., 503. Decided February 24, 1917.

Carrying Passenger to Destination—Conduct of Conductor

Action was brought for damages as a passenger for being wrongfully carried past Ridgeway to Norlina, N. C., and for punitive damages because of insulting and humiliating conduct toward the plaintiff by the conductor of the train. The plaintiff boarded a train that did not stop at Ridgeway, the station called for by his ticket. The conductor, acting within his rights, told him the train did not stop there, and that he would have to get off at Henderson, a nearer station. On the passenger's refusing, the conductor told him he would put him off, and later, when the passenger protested, said that if he was that kind of man he would himself give him ten cents to pay his way to Norlina. The plaintiff testified that he decided to sue the railroad because he thought the conductor treated him with ridicule and humiliated him. The North Carolina Supreme Court held that the passenger, having actual notice that the train would not stop at the station called for by his ticket, could not recover damages for being carried beyond such station. And he was not entitled to punitive damages, the language used by the conductor not having been rude, insulting or humiliating. Judgment for the plaintiff was reversed.—Meeder v. Seaboard Air Line (N. Car.), 91 S. E., 527. Decided February 28, 1917.

Damages from Overflow

The Nebraska Supreme Court holds, though pointing out that there is some conflict in the authorities on the point, that overflow waters of a stream which have spread over the adjoining country, whence they disappear only by evaporation or percolation, may be defended against as surface waters, but overflow waters which flow in an accustomed course through a depression into the same stream at a lower point in its course or into another stream or lake, though they do not flow in a channel with well-defined banks, do not become surface waters, and if their accustomed course is negligently obstructed by a railroad embankment, the railroad company is liable for damages to crops caused by the waters so retained. If, however, some damage would have occurred even if the railroad embankment had not been built, the company would only be liable for such damages in addition thereto as were caused by the damming or obstruction of the waters to a greater height, or for a longer time than would otherwise have occurred.—Murphy v. C. B. & Q. (Neb.), 161 N. W., 1,048. Decided March 31, 1917.

UNITED STATES SUPREME COURT

The United States Supreme Court on May 21 ordered reargumments in five important cases under the anti-trust law, brought by the government against the United States Steel Corporation, the International Harvester Company, the United Shoe Machinery Company, the Lehigh Valley Railroad and the Reading Company. As the court will adjourn on June 11, it is believed that this action will postpone any settlement of these cases until some time in 1918.

The United States Supreme Court on May 21 in a decision in a test case brought by the St. Louis & San Francisco against the state of Arkansas, declared confiscatory the Arkansas rate law of 1907. The case turned on the method of determining the question as to whether the rates fixed by the state law were confiscatory.

The United States Supreme Court on Monday sustained as constitutional provisions of the Missouri statute of 1909, prohibiting railroads from charging higher rates for a short than for a long haul.

The Supreme Court also reversed a decree of the United States District Court for the Eastern District of Illinois enjoining the Interstate Commerce Commission from enforcing its order against the Illinois Central, prescribing a method of distributing coal cars and awarding reparation to shippers for failure to supply cars. The case was remanded to the lower court with directions to grant motions to dismiss the petition.

The New York Workmen's Compensation law, recently upheld as constitutional by the Supreme Court, has been construed as not applicable to workmen injured on ships while in New York navigable waters. The Federal maritime laws are exclusive and paramount.

The New York law is not applicable to railroad workmen injured while in interstate commerce, and compensation awards to James Winfield, a New York Central Railroad track laborer, under the state law, are reversed.

The New Jersey Workmen's Compensation law of 1911, a non-compulsory statute, was decided to be unconstitutional as to railroad employees injured while engaged in interstate commerce. In this case Justices Brandeis and Clark dissented.

The Ohio workmen's compensation and employers' liability laws, the Supreme Court decided, are applicable to workmen injured on ships while in Ohio navigable waters. Operation of the Ohio laws was held by the court to be limited to vessels engaged solely in intrastate commerce.

Equipment and Supplies

LOCOMOTIVES

THE CHICAGO & ALTON is contemplating the purchase of 10 Santa Fe type locomotives.

THE PENNSYLVANIA LINES WEST are having 30 passenger locomotives built at the Altoona shops.

THE BRITISH WAR OFFICE has ordered 50 six-wheel (0-6-0) locomotives from the Baldwin Locomotive Works.

THE UNITED STATES GOVERNMENT has ordered two 0-4-2 type locomotives from the Baldwin Locomotive Works.

THE ARICA-LA PAZ RAILWAY (Chile) has ordered 3 Mallet type locomotives from the Baldwin Locomotive Works.

THE PORVENIR SUGAR COMPANY, Cuba, has ordered one Mogul type locomotive from the Baldwin Locomotive Works.

THE NORTH AMERICAN SUGAR COMPANY has ordered one Consolidation locomotive from the Baldwin Locomotive Works.

THE SIEMS-CAREY RAILROAD & CANAL COMPANY is reported as inquiring for 400 locomotives for the lines that company is building in China. Delivery is specified for 1918.

THE NORFOLK & WESTERN, reported in the *Railway Age Gazette* of May 11 as asking prices on 30 Mallet type locomotives, has withdrawn its inquiries and may build the locomotives or some of them in its own shops.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE has ordered 3 superheater Mikado locomotives from the American Locomotive Company. These locomotives will have 28 by 30 in. cylinders and a total weight in working order of 285,000 lb.

THE NORTHERN PACIFIC was reported in last week's issue as having ordered 40 Mikado locomotives from the American Locomotive Company. These locomotives will have 28 by 30 in. cylinders and a total weight in working order of 320,000 lb.

THE RUSSIAN GOVERNMENT.—Definite negotiations are under way on behalf of the Russian Government for the purchase in this country of 300 Decapod locomotives and reports have it that orders may possibly be placed eventually for 2,000 locomotives. The purchasing is in the hands of the authorities at Washington and the engines will be paid for out of loans to Russia by the United States Government.

THE PENNSYLVANIA RAILROAD has placed orders on behalf of the Lines East of Pittsburgh for 275 locomotives, constituting the 1918 program. Of these 275 new locomotives, 245 will be built at the Altoona shops and 30 by the Baldwin Locomotive Works. Of the total number 169 are for replacements and 106 are additions. For replacements there will be built 19 shifting, 51 heavy passenger and 99 heavy freight locomotives. The 106 new locomotives include 23 shifting locomotives, 30 heavy passenger locomotives, 30 Mikado locomotives of the L-1-s type and 23 Decapod (I-1-s) type locomotives. The last is a new design recently developed at the Altoona shops. The Altoona shops, in addition to constructing 245 locomotives for the Lines East, on the 1918 program, have uncompleted orders for 180 on the 1917 program, and will also build 30 heavy passenger engines for the Lines West, during the present year. This brings the total locomotives at present on order at Altoona to 455, a number more than sufficient to keep the locomotive shop running to fullest capacity during the remainder of the present year and during the year 1918.

FREIGHT CARS

THE MICHIGAN CENTRAL is inquiring for 100 underframes.

THE PENNSYLVANIA RAILROAD has issued an inquiry for 2,000 freight cars.

THE UNITED STATES NAVY DEPARTMENT has ordered 71 flat and 37 box cars from the American Car & Foundry Company.

THE MACK MANUFACTURING COMPANY, Evanston, Ill., reported in last week's issue as having ordered 12 hopper cars from the Pressed Steel Car Company, has also ordered 4 flat cars from the Bettendorf Company.

THE RUSSIAN GOVERNMENT was recently reported as inquiring for 3,000 four-wheel 1,200 pood box cars. This inquiry has now been expanded to 10,000 cars and reports have it that the order may be divided equally among five important car builders. The purchases are being made for Russia by the United States Government.

PASSENGER CARS

THE ILLINOIS CENTRAL has placed an order with the Pullman company for 71 passenger cars, divided as follows: 10 70 ft. chair cars; 25 70-ft. coaches; 8 70-ft. combination passenger and baggage cars; 10 70-ft. baggage cars; 10 60-ft. baggage cars for the storage of mail, and 5 60-ft. baggage and mail cars.

IRON AND STEEL

THE CHICAGO & NORTHWESTERN has placed an order for 190 tons of steel for an elevator at Council Bluffs, Ia.

MISCELLANEOUS

THE DELAWARE, LACKAWANNA & WESTERN has awarded a contract to the Roberts & Schaefer Company for the building of an automatic electric, two-track, 400-ton coaling plant at Hoboken, N. J.

THE PENNSYLVANIA RAILROAD has awarded a contract to the Roberts & Schaefer Company, Chicago, for the building of a 200-ton automatic electric, frame constructed coaling plant, for immediate installation at Osceola Mills, Pa.

SIGNALING

THE MISSOURI PACIFIC has ordered from the General Railway Signal Company a mechanical interlocking plant to be installed by the railroad company at Sedalia, Mo., the machine to be Saxby & Farmer type, 40 levers.

THE PITTSBURGH & LAKE ERIE has ordered from the General Railway Signal Company material for an electric interlocking plant at Neville, Pa., 66 working levers and 38 spare spaces; also for an electric interlocking at McKees Rocks, Pa., 54 working levers and 18 spare spaces.

CHINESE RAILROAD EMPLOYEES SAVE MONEY.—All employees of the Shanghai-Nanking and the Shanghai-Hanchow-Ningpu railroads will hereafter have "money in the bank." They have organized a savings society, elected officers from their number, and drawn up their own rules and regulations. Each member of the society agrees to deposit 5 per cent of his salary every month, on which he receives interest at the rate of 5 per cent. The money is in turn loaned to any of the members who make application at an interest of 10 per cent. This savings-and-loan institution has met with a great deal of satisfaction among the employees of these railroads, and it is expected that their example will be followed on other railroads.

RUSSIAN RAILWAYS IN PEACE AND IN WAR.—The army and the munition industries alone absorb fully 50 per cent of the carrying capacity of the Russian railways, so that there remains only 50 per cent to satisfy the needs of the civilian population, which have also grown, as compared with peace time. In 1916 the Russian railways had to carry in the department of mineral fuel alone 2,700,000 tons more than in 1915. As to passenger traffic, great as are the inconveniences to which the civilians are subjected, the railway ministry cannot hold out any hope of improvement either now or in the near future, because a large number of passenger cars had to be turned into hospital coaches, while all the passenger car works, both in Russia and abroad, are engaged in building freight cars only. The passenger traffic, on the other hand, has greatly increased during the last two years, roughly by 20 per cent, and on some railways by 40 per cent.—*Railway Gazette, London.*

Supply Trade News

Frank W. Marvel, sales manager of the Buda Company, Chicago, Ill., has been appointed special representative in eastern territory for the Indianapolis Switch & Frog Company, Springfield, Ohio.

Walter Brunswick, formerly connected with the sales department of the American Locomotive Company, has been appointed engineer in charge of the engineering department of Dowler, Forbes & Co. of New York and Shanghai.

The Coleman Railway Supply Company has been organized by W. W. Coleman and George E. Neil as partners, with office at 30 Church street, New York. The company will handle a general line of railway appliances and supplies.

At a meeting of the board of directors of the Walter A. Zelnicker Supply Company, St. Louis, held April 19, A. R. Topping was elected secretary of the company. Mr. Topping has been associated with the Zelnicker Company for the past eleven years.

Keith R. Rodney, for many years connected with the Midvale Steel Company, and for the past two years supervisor of heat treating at the Winchester Repeating Arms Company, New Haven, has recently joined the staff of the Bullard Machine Tool Company as metallurgist and special counselor in the selection and treatment of steels.

The Freeland derails and Newton replacers previously sold by the Hobart Alfree Company, Old Colony building, Chicago, have been sold to the Q & C Company, New York, St. Louis and Chicago, who will hereafter include these devices with the Fewings car replacers and the Q & C adjustable derails now sold by the Q & C company.

Robert L. Gordon, assistant to the president of the Standard Steel Car Company, has been elected vice-president of that company, and vice-president of the Forged Steel Wheel Company and other associated companies, succeeding James B. Brady, deceased. Mr. Gordon graduated from Cornell University, class of 1895, with the degree of mechanical engineer, and after leaving college went with the Baldwin Locomotive Works. He was afterward connected with the Fox Pressed Steel Equipment Company, and later with the Pressed Steel Car Company, and has been connected with the Standard Steel Car Company since its organization, having acted as assistant to the president for the last 12 years.

Ellsworth L. Mills, who has been at the head of the track division of the New York Public Service Commission, First district, has resigned from the firm of Messrs. Gibbs & Hill, consulting engineers to the commission, and in the future will be associated with the firm of Dilworth, Lockwood & Co., steel merchants, at 260 West street, New York, in the development and management of a railway supply department, handling a line of track supplies and specialties. During his connection with the commission, Mr. Mills was in charge of the design and the preparation of the contracts for the track work for the dual system. Before becoming associated with Messrs. Gibbs & Hill, Mr. Mills was engaged on the Grand Central terminal improvements of the New York Central. Since Mr. Mills' resignation Robert H. Jacobs, division engineer, has assumed supervision of track design and of all contracts for the purchase of materials in connection with his work of supervision of track construction.

F. Quattrone, chief engineer of the Italian State Railways, returned to the United States a few days ago. Mr. Quattrone is well known in New York as he arrived here during the early months of the war as the head of the Italian State Railway Commission and the representative for the Ministry of Agriculture. He placed large contracts running into many millions of dollars for locomotives, cars and other railway materials and purchased and shipped large supplies for the Italian Agricultural Department as well. Mr. Quattrone left his post in New York last September to become a member of the International Food Commission of London and to act as representative in that city for Mr. Bianchi, the Italian coal controller. Mr. Quattrone returns now to the United States as a special delegate of the Italian Government as well as of the Italian State Railways, to be attached to the Italian Embassy at Washington, and will have in charge the purchase and shipment of all materials to be contracted for by the Italian Government.

Committees to Study Possibilities of Car and Locomotive Building

S. M. Vauclain of the Baldwin Locomotive Works has been appointed chairman of two committees appointed by the car and locomotive builders of the country, as sub-committees of the Advisory Commission of the Council of National Defense, to make a study and report for the benefit of the government regarding the situation of the car and locomotive plants of the country as to capacity, etc., in order that the government may have available information as to what may be done in furnishing additional railroad equipment and power both for the railways of the United States and for the Allies.

General Railway Signal Company

C. O. Poor, formerly assistant resident manager of the Chicago district and later in charge of the munition plant of the General Railway Signal Company, has been appointed president and general manager of the General Railway Signal Company of Canada, Limited, with headquarters at Montreal, Que. V. I. Smart of the General Railway Signal Company of Canada, Limited, has been appointed consulting engineer for the company with headquarters as heretofore at Montreal.

F. H. Jones, who has been with the General Railway Signal Company for over twelve years, has been returned to his former position as assistant resident manager of the Chicago district. Mr. Jones will be located at the Peoples Gas building, Chicago.

Mr. Poor, after finishing high school in Port Chester, N. Y., was employed for two years in the freight office of the New York, New Haven & Hartford at Greenwich, Conn. In 1892, he served as clerk in the construction department of the Hall Signal Company at Chicago. He afterwards served as superintendent of the Hall Signal Company's works at Garwood, N. J., from 1896 to 1905, but spent the summer of 1904 in Europe, studying the signaling systems of France, Belgium and England. From 1905 to 1912, Mr. Poor was superintendent of the works of the General Railway Signal Company at Rochester, N. Y., and in 1912 was appointed to the position of assistant resident manager at Chicago, which position he vacated July 1, 1916, to take charge of the General Railway Signal Company's munition plant at Rochester, N. Y. Mr. Poor was appointed to his present position on May 1, and is now located at Montreal, Que.

TRADE PUBLICATIONS

TOOLS.—Tool book No. 13, recently issued by the Goodell-Pratt Company, Greenfield, Mass., is a 432-page booklet descriptive of the company's line of tools of all kinds.

METAL HOSE.—A booklet recently issued by the Pennsylvania Flexible Metallic Tubing Company, Philadelphia, illustrates and describes the company's Penflex metal hose. Several pages of the book are devoted to the use of the hose by railways.

CONCRETE MACHINERY.—The Waterloo Cement Machinery Corporation, Waterloo, Ia., has issued a pamphlet containing detailed information concerning the products of this corporation. These include concrete mixers for various services, gasoline hoisting engines, construction elevators, diaphragm pumps and bank filling outfits. The catalogue goes into detail as to the construction, capacity and applicability of the mixers to various uses.

MODERN METHODS IN CONCRETE CONSTRUCTION.—The Hydrated Lime Bureau, Pittsburgh, Pa., has issued bulletin A-5, describing the advantage of using hydrated lime in concrete because it permits a material reduction in the amount of water used in mixing. The booklet opens with a discussion of the growing opposition to the use of an excess of water in concrete and the increased plasticity of concrete containing reduced amounts of water to which hydrated lime has been added. This is followed by records of experience with this material in various concrete construction jobs throughout the country.

Railway Construction

CHICAGO, SPRINGFIELD & CAIRO.—This company has filed a petition with the State Public Utilities Commission of Illinois for a certificate of convenience and necessity authorizing it to construct a railroad from Springfield, Ill., through Pawnee, Hillsboro, Greenville, Nashville, Pinckneyville, Murphysboro and Jonesboro to Cairo. J. B. Campbell, president; A. E. Taylor, secretary. The principal office is in Chicago.

ILLINOIS CENTRAL.—This company has given a contract to the Railroad Water & Coal Handling Company, Chicago, Ill., for the installation of pipe lines, hydrants, penstocks and other auxiliaries for the water supply of its new engine terminal at Baton Rouge, La. The estimated cost of these improvements is $15,000.

A contract has been awarded by the Illinois Central to Philbrick & Baxter, Jackson, Miss., for the grading for about 23 miles of second track at two points on the Yazoo & Mississippi Valley. One stretch of about 12 miles is between Marienette, Miss., and Pritchard, and the other section of about 11 miles is between Gwin and Cruger. The total cost, including bridges and tracks, will reach $500,000.

The Illinois Central is contemplating the construction of a large hump yard and engine terminal facilities near Harvey (Chicago), Ill., which will serve as a division terminal for all freight traffic from the South, except fruit and vegetable trains, which will continue to go direct to South Water street. This yard will relieve the facilities now existing at Burnside, Fordham and Riverdale.

MEXICAN ROADS.—A press despatch from the city of Mexico reports the completion of the railroads from Durango, eastward to Canipas, about 120 miles, which has been under construction for several years. Notwithstanding the interference that was caused by revolutionary disturbances, construction work has been kept up intermittently. The road is expected to be opened for regular traffic about June 1. By the opening of this line the route from Durango to the City of Mexico and other points south of Canipas will be about 100 miles shorter than heretofore.

The Mexican Government has let a contract for the establishment of a deep water port on the coast of Quintana Roo at the Bay of Esperitus Santos. Quintana Roo was formerly a part of the State of Yucatan, and it is expected that the lines of the United Railways of Yucatan will be extended from Valladolid southward about 100 miles to the new port. Yucatan has now no satisfactory deep water port.

NEW YORK CENTRAL.—The contract for building the engine-house with turntable and annex buildings at Gardenville, N. Y., was given to the John W. Cowper Company, Buffalo, N. Y., and not as previously reported to John W. Cooper & Co.

SOUTHERN RAILWAY.—The contracts recently let by this company for double tracking work on 26.2 miles of the Cincinnati-Chattanooga lines were given to the following contractors: Between Lancing, Tenn., and Huffman, to H. H. Thrasher, Knoxville, Tenn.; between Robbins and Helenwood to the Shehan Construction Corporation, Roanoke, Va.; between Moreland, Ky., and South Fork, to the Mann Construction Company, Knoxville (May 18, p. 1076.)

TEXAS RAILROADS (ELECTRIC).—The Standard Utilities Construction Company, with headquarters at Denton, Tex., intends soon to construct a standard interurban railway from Dallas, Tex., through Denton to Slidelly, a distance of 58 miles. After this first unit is in operation it is planned to extend the road 50 miles further. Actual construction is expected to begin immediately. C. F. Hopkins, Tulsa, Okla., president; A. E. De Mayo, Denton, Tex., vice-president and general manager.

VIRGINIAN RAILWAY.—Contracts have been let to the Wellman-Seaver-Morgan Company, the Virginia Bridge & Iron Company and J. P. Pettyjohn & Company for concrete and steel work, in connection with improvements to provide additional dumping facilites for the coal pier at Norfolk, Va. The cost of the work will be about $673,000.

Railway Financial News

BOSTON & MAINE.—Senator Cummins has introduced in Congress a resolution directing the Interstate Commerce Commission to make an investigation and report to the Senate on matters pertaining to the attempts to reorganize and re-establish this company, including facts and circumstances relating to the financial transactions of the Boston & Maine, the organization of the Boston & Maine Holding company, the deposit of the stock of that company in the hands of trustees, the appointment of a receiver for the Boston & Maine, the consolidation with leased lines and the organization and financing of the Hampden Railroad Corporation.

Judge Morton in the United States District Court at Boston has given the receiver authority to extend $750,577.50 of Fitchburg notes, due June 1, 1916, to June 1, 1918.

CHESAPEAKE & OHIO.—See comments on the annual report for the calendar year 1916 elsewhere in this issue.

CHICAGO & EASTERN ILLINOIS.—Judge Carpenter of the United States District Court at Chicago has ordered the sale of this road at auction on June 17. The upset price for the C. & E. I. proper is $10,000,000. A tentative reorganizatiton plan has been drawn which provides for an assessment of $30 a share on the present outstanding stock and new cash of between $12,000,000 and $13,000,000, to be raised by the issuance of new securities. It is planned to put out only one issue of stock. Income bonds will be issued in place of a large amount of bonds now outstanding. A small amount of bonds, between $6,000,000 and $7,000,000, on which there has been no default, will probably be left untouched in the reorganization. Receivers' certificates now aggregate $6,000,000, and the total sum in default is about $50,000,000. The fixed obligations of the company, now amounting to $3,750,000, will be reduced approximately to about $2,250,000. The reduction in fixed charges will be accomplished largely through the divorcing of the Chicago & Indiana and the Evansville & Indianapolis railroads.

DENVER & RIO GRANDE.—Judge Hand, in the United States District Court at New York has handed down a decision awarding the Equitable Trust Company a verdict of $32,272,274 in its suit against the Denver & Rio Grande to enforce the liability of the Denver & Rio Grande on its guarantee of the $50,000,000 bonds of the Western Pacific, issued in 1905, on which both principal and interest have been defaulted. Fearing that the payment of such a large sum by the Denver & Rio Grande at this time might force it into the hands of receivers, the common and preferred stockholders have formed a protective committee, consisting of Harry Brenner, J. Horace Harding, John W. Platten and Harrison Williams.

NEW YORK, NEW HAVEN & HARTFORD.—Judge Crosby of the Massachusetts Supreme Court has entered a final decree in the $102,000,000 suit of Ralph S. Bartlett and other minority stockholders. By this decree an injunction which was issued by Judge Braley in the summer of 1914, restraining the company from transferring on its books any of the stock in the corporation held by the several individual defendants named in the suit, is dissolved and the stock is released.

UNION PACIFIC.—See comments on the annual report for the calendar year 1916 elsewhere in this issue.

FREIGHT TRAFFIC ON MURMAN RAILROAD.—Freight traffic has now been temporarily opened on the third (middle) section of the Murman Railroad, thus giving through rail connection between the interior railroad system of Russia and Port Romanoff, on the Arctic ocean. It is hoped to establish on the Murman line a daily freight service of about 200 cars, with an aggregate capacity of 300,000 to 400,000 poods (5,400 to 7,200 short tons). It should be remembered that the northern terminus of this railway is not the port of Kola, but a new harbor called Port Romanoff, 7 miles down the bay from Kola.

ANNUAL REPORT

THE CHESAPEAKE AND OHIO RAILWAY COMPANY THIRTY-NINTH ANNUAL REPORT

RICHMOND, VA., April 19, 1917.

TO THE STOCKHOLDERS:

The Thirty-ninth Annual Report of the Board of Directors, for the fiscal year ended December 31, 1916, is herewith submitted. There are also submitted herein certain tables relating to the operation for the period of six months ended December 31, 1916.

The average mileage operated during the year by The Chesapeake and Ohio Lines was 2,378.7 miles, an increase over the previous year of 6.0 miles. The mileage at the end of the year was 2,380.7 miles, an increase of 6.4 miles over mileage on December 31, 1915. See schedule on page 12.

RESULTS FOR THE YEAR.

Operating Revenues were (Increase $6,253,471.30, or 14.35%.)	$49,834,312.18
Operating Expenses were (Increase $3,700,050.13, or 13.76%.)	32,698,675.85
Net Operating Revenue was (Increase $2,553,421.17, or 17.51%.)	$17,135,636.33
Taxes were (Increase $190,919.05, or 13.21%.)	1,636,604.01
Operating Income, Taxes, deducted, was (Increase $2,362,502.12, or 17.98%.)	$15,499,032.32
Miscellaneous Income was (Increase $807,150.03, or 96.78%.)	1,641,142.98
	$17,140,175.30
Rentals and Other Payments were (Increase $266,053.22, or 32.27%.)	1,090,460.44
Income for the year available for interest was (Increase $2,903,598.93, or 22.09%.)	$16,049,714.86
Interest (52.23% of amount available) amounted to (Increase $328.738.28, or 4.08%)	8,382,833.09
Net Income for the year, equivalent to 12.21% on capital stock outstanding, amounted to (Increase $2,574,860.65, or 50.57%.)	$ 7,666,881.77
Dividends paid during year: One dividend of 2%	$ 1,255,632.00
Remainder	$ 6,411,249.77

RETURN ON PROPERTY.

The following table shows the amount of return to your Company, including subsidiary companies, from transportation operations only, upon its investment in road and equipment at the termination of each year of the five year period ended December 31, 1916:

	Property Investment.	Total Operating Income.	Percentage of Return.
Year ended December 31, 1916	$250,247,098.33	$15,359,715.04	6.14%
Year ended December 31, 1915	244,068,206.05	12,465,058.24	5.11%
Year ended December 31, 1914	243,144,711.90	9,314,430.78	3.83%
Year ended December 31, 1913	236,065,971.07	9,382,649.18	3.97%
Year ended December 31, 1912	230,801,618.77	10,600,231.82	4.59%
Yearly average for five years ended December 31, 1916	$240,865,521.22	$11,424,417.01	4.74%

FINANCIAL.

The changes in funded debt in the hands of the public during the year were as follows:

	Sold	Retired
5 per cent. Convertible Thirty-year Secured Gold Bonds	$40,180,000.00	
4½ per cent. Equipment Trust Certificates—Series "O"	3,160,000.00	
5 per cent. Five Year Secured Gold Notes		$33,000,000.00
4 per cent. Big Sandy Ry. First Mortgage Bonds		111,000.00
4 per cent. Coal River Ry. First Mortgage Bonds		67,000.00
4 per cent. Greenbrier Ry. First Mortgage Bonds		39,000.00
4 per cent. Raleigh & Southwestern Ry. First Mortgage Bonds		5,000.00
Equipment Trust Obligations		1,270,696.00
	$43,340,000.00	$34,492,696.00
Net Increase	8,847,304.00	

Other changes in obligations shown under funded debt on balance sheet of December 31, 1916, were as follows:

	Increase	Payments
5 per cent. First Lien and Improvement Mortgage Bonds	$ 6,995,000.00	
6 per cent. Equipment Contracts—General Equipment Co.		$ 1,000.00
5 per cent. Equipment Contract—Standard Steel Car Co.		628,241.77
5 per cent. Equipment Contract—Central Locomotive and Car Works		68,172.94
6 per cent. Equipment Contract—American Locomotive Co.		160,789.36
5½ per cent. Equipment Contract—Central Locomotive and Car Works	253,025.00	120,000.00
	$ 7,248,025.00	$ 978.204.07
Net Increase	6,269,820.93	

Five per cent. Convertible Thirty Year Secured Gold Bonds, of a face amount of $40,180,000, maturing April 1, 1946, were issued under a closed mortgage dated April 1, 1916, to Central Trust Company of New York, trustee, secured by a face amount of $45,920,000 of your company's First Lien and Improvement Mortgage Bonds and sold to provide funds for the retirement of $33,000,000 Five Year five per cent. Secured Gold Notes called for payment at a premium of 1%, June 1, 1916, and for other capital purposes.

Four and one-half per cent. Equipment Trust Certificates Series "O," amounting to $3,160,000, were issued and sold to provide funds for payment of equipment shown in table on page 19.

Five per cent. First Lien and Improvement Mortgage Bonds, of a face amount of $6,995,000, were issued during the year for additions and betterments and other capital purposes. The total amount of these bonds outstanding aggregate $47,265,000, of which $45,920,000 are pledged and $1,345,000 are held in the treasury.

Your Company acquired during the year 11,722 additional shares of the capital stock of The Chesapeake and Ohio Northern Railway Company, payment for which was made out of cash derived from the sale of The Kanawha and Michigan Railway Company's stock. Of the proceeds of the sale there is still deposited with the Trustee for future investment the sum of $1,473,600.

There were also acquired 539 additional shares of capital stock of the Pond Fork Railway Company, which is constructing a line of railroad from a point near Madison, W. Va., up Pond Fork of Coal River, and additional shares of capital stock of the White Sulphur Springs, Inc. Additional First Mortgage Bonds of the Elkhorn and Beaver Valley Railway Company were acquired at par in reimbursement for advances for construction purposes.

Securities of The Chesapeake and Ohio Equipment Corporation, issued in respect of the cost of twenty-four Mallet locomotives, were acquired by your Company and the cost of same is included in property account.

Further shares of stock and First Mortgage Bonds of The Chesapeake and Ohio Railway Company of Indiana were issued in respect of the cost of certain additions and betterments made to that line and were pledged under your Company's First Lien and Improvement Mortgage.

A statement of charges to property accounts will be found on page 16, showing a net addition of $6,189,605.24; that is, $1,836,380.07 was added to cost of road and $4,353,225.17 was added to cost of equipment.

A schedule of securities owned December 31, 1916, will be found on page 17.

During the past eight years your Company's increase in capital liabilities in hands of the public, its principal acquisitions of stocks and bonds of other companies, and its expenditures for equipment, branch line construction, second track and other addtions and betterments, have been as follows:

CAPITAL OBLIGATIONS ISSUED OR ASSUMED:	PAR VALUE.	
General Mortgage 4½% Bonds	$ 4,306,000.00	
General Funding and Improvement Mortgage 5% Bonds	11,000,000.00	
First Consolidated Mortgage 5% Bonds	2,000,000.00	
Convertible 4½% Debentures	31,390,000.00	
Three Year 4½% Collateral Trust Notes	25,000,000.00	
One Year 5% Collateral Trust Notes	3,500,000.00	
Five Year 5% Collateral Trust Notes	33,000,000.00	
Convertible 5% Secured Gold Bonds	40,180,000.00	
Coal River Railway Co. First Mortgage 4% Bonds	3,000,000.00	
Raleigh and Southwestern Railway Co. First Mortgage 4% Bonds	860,000.00	
Big Sandy Railway Co. First Mortgage 4% Bonds	229,000.00	
Virginia Air Line Railway Co. First Mortgage 5% Bonds	900,000.00	
Equipment Trust Certificates Series "N"	1,700,000.00	
Equipment Trust Certificates Series "O"	3,160,000.00	
Equipment Contracts, Various	4,809,390.00	
	$165,034,390.00	
Realizing		$156,484,690.92
Less:		
CAPITAL OBLIGATIONS PAID OR PURCHASED:		
Six Percent. Collateral Gold Notes	$ 5,000,000.00	
Collateral Gold 6% Notes	2,500,000.00	
Peninsula Division First Mortgage 6% Bonds matured January 1, 1911	2,000,000.00	
Greenbrier and New River Railroad Co. First Mortgage 5% Bonds redeemed February 1, 1911	339,000.00	
General Funding and Improvement Mortgage 5% Bonds	7,302,000.00	
Greenbrier Railway Co. First Mortgage 4% Bonds retired November 1, 1911	2,000.00	
Three Year 4½% Collateral Trust Notes	25,000,000.00	
One Year 5% Collateral Trust Notes	3,500,000.00	
Five Year 5% Secured Gold Notes	33,000,000.00	
Kineon Coal Co. First Mortgage Bonds	200,000.00	
Equipment Trust Payments	13,182,000.00	
Through Sinking Funds:		
Big Sandy Railway Co. First Mortgage 4% Bonds	437,000.00	
Coal River Railway Co. First Mortgage 4% Bonds	224,000.00	
Greenbrier Railway Co. First Mortgage 4% Bonds	157,000.00	
Raleigh and Southwestern Railway Co. First Mortgage 4% Bonds	43,000.00	
	$ 92,886,000.00	
Costing		93,614,994.59
		$ 62,869,696.33
ACQUISITIONS:		
Stocks of:		
The C. & O. Railway Co. of Indiana	$ 5,998,800.00	
Elkhorn and Beaver Valley Railway Co.	30,000.00	
Gauley and Meadow River Railroad Co.	116,300.00	
The Hocking Valley Railway Co.	7,671,900.00	
The Cincinnati Inter-Terminal Railroad Co.	56,000.00	
Logan and Southern Railway Co.	292,100.00	
Levisa River Railroad Co. (of Ky.)	50,000.00	
The Levisa River Railroad Co. (of Va.)	50,000.00	
Kanawha Bridge and Terminal Co.	400,000.00	
The Silver Grove Land and Building Co.	200,000.00	
White Sulphur Springs, Incorporated	2,560,000.00	
First National Bank Building Corporation (Richmond, Va.)	180,000.00	
The Chesapeake and Ohio Northern Railway Co.	2,552,900.00	
Pond Fork Railway Co.	59,100.00	
Miscellaneous	32,300.00	
	$ 20,249,400.00	
Costing		$ 21,584,341.89

Bonds and Notes of:		
Atlantic Coast Line R. R. Mo. Equipment Bonds, 4%	$ 6,000.00	
Baltimore and Ohio R. R. Co. Equipment Certificates, 4½%	180,000.00	
The C. & O. Railway Co. of Indiana First Mortgage 5%	6,869,000.00	
Elkhorn and Beaver Valley Railway Co. First Mortgage 5%	1,031,000.00	
Illinois Central R. R. Co. Equipment Certificates 4½%	99,000.00	
Southern Pacific R. R. Co. Equipment Certificates 4½%	2,000.00	
Pennsylvania R. R. Co., Promissory Notes 3½%	500,000.00	
Miscellaneous	280,000.00	
	$ 8,967,000.00	
Costing		7,559,019.26
Properties of:		
Coal River Railway Co.	$ 2,304,359.88	
Raleigh and Southwestern Railway Co.	816,562.42	
Virginia Air Line Railway Co.	1,071,947.12	
Costing	$ 4,192,869.42	4,192,869.42
Construction of:		
Extension of Branch Lines, costing	$ 1,744,281.94	
Second Track (176.5 miles) and Additions and Betterments, costing	18,305,393.17	
		20,049,675.11
(Excluding $2,320,823.99 expended on Chicago Line to April 30, 1916, for which securities have been acquired.)		
Equipment:		
Additional equipment acquired (less retirals)		23,166,621.03
(Excluding $24,586.89 expended on Chicago Line to April 30, 1916, for which securities have been acquired.)		
Costing		$ 76,552,526.71

GENERAL REMARKS.

The Interstate Commerce Commission at a general session held November 24, 1916, ordered all common carriers, subject to the provisions of the Act to Regulate Commerce, to file with the Commission, on or before the thirty-first day of March in each year, reports covering the period of twelve months ending with the preceding thirty-first day of December, thereby changing the fiscal year period from June 30th. In conformity with this order your Board at its meeting held December 21, 1916, authorized the preparation for distribution to the stockholders of the annual report of your Company for the fiscal year from January 1st to December 31st of each year, (instead of as heretofore from July 1st to June 30th), beginning with the year January 1st, 1916, to December 31st.

The equipment inventory as of December 31, 1916, was as follows:

Locomotives owned	648	Inc.	73
Locomotives leased	178	Dec.	34
Total	826	Inc.	39
Passenger train cars owned	335	Dec.	12
Passenger train cars leased	49	Inc.	20
Total	384	Inc.	8
Freight train and miscellaneous cars owned	26,811	Inc.	4,344
Freight train cars leased	19,702	Dec.	3,755
Total	46,513	Inc.	589

There were undelivered December 31, 1916, 200 Steel Gondola Cars purchased under Equipment Trust Series "O," as shown on page 19 of this report, that are not included in the above table. Your Company ordered additional new equipment during the year, none of which was delivered until after January 1, 1917, as follows: 50 Mallet Locomotives, 1,000 seventy ton and 2,000 fifty-five ton Steel Coal Cars, 10 Steel Passenger Coaches, 2 Steel Parlor Cars and 1 Steel Dining Car.

The changes during the year in the accrued depreciation of equipment account were as follows:

Balance to credit of account December 31, 1915			$5,181,007.39
Amount credited during year ended December 31, 1916, by charges to:			
Operating expenses	$951,081.93		
Charges to account for:			
Accrued depreciation on equipment retired during year—			
6 locomotives. 2 passenger train cars, 3,764 freight train and work cars	$279,804.64		
Accrued depreciation on cars changed in class during year	5,574.17	285,378.81	
			665,703.12
Balance to credit of account December 31, 1916			$5,846,710.51

	1916	1915		
Operating Revenues amounted to	$49,834,312.18	$43,580,840.88	Inc.	$6,253,471.30
Net Operating Revenue	$17,135,636.33	$14,582,215.16	Inc.	$2,553,421.17
Operating Ratio	65.6%	66.5%	Dec.	.9%
Tons of Revenue Freight carried one mile	10,437,225,643	9,274,753,635	Inc.	1,162,472,008
Revenue train loads, tons	1,007	954	Inc.	53
Revenue tons per loaded car	34.1	33.0	Inc.	1.1

The revenue coal and coke tonnage was 27,298,125, an increase of 17.2 per cent; other freight tonnage was 11,153,755, an increase of 13.4 per cent. Total revenue tonnage was 38,451,880 tons, an increase of 16.1 per cent. Freight revenue was $39,888,932.23, an increase of 13.3 per cent. Freight train mileage was 10,367,744 miles, an increase of 6.6 per cent. Revenue ton miles were 10,437,225,643, an increase of 12.5 per cent. Ton mile revenue was 3.82 mills, an increase of 0.5 per cent. Revenue per freight train mile was $3.847, an increase of 6.3 per cent. Revenue tonnage per train mile was 1,007 tons, an increase of 5.6 per cent; including Company's freight, the tonnage per train mile was 1,069 tons, an increase of 5.6 per cent. Tonnage per locomotive, including Company's freight, was 946 tons, an increase of 5.1 per cent. Revenue tonnage per loaded car was 34.1 tons, an increase of 3.3 per cent. Tons of revenue freight carried one mile per mile of road were 4,387,786, an increase of 12.2 per cent.

There were 7,012,014 passengers carried, an increase of 7.7 per cent. The number carried one mile was 301,961,827, an increase of 12.5 per cent. Passenger revenue was $6,435,025.33, an increase of 12.6 per cent. Revenue per passenger per mile was 2.131 cents, an increase of 0.1 per cent. Number of passengers carried one mile per mile of road was 126,944, an increase of 12.2 per cent. Passenger train mileage was 5,212,111, an increase of 7.6 per cent. Passenger revenue per train mile was $1.235, an increase of 4.7 per cent; including mail and express, it was $1.454, an increase of 4.3 per cent. Passenger service train revenue per train mile was $1.491, an increase of 4.6 per cent.

A spur track 4.7 miles in length, leaving the main line at Penniman Junction, just east of Williamsburg, Va., and extending to the plant of the E. I. duPont de Nemours Company at Penniman, has been completed.

Extensions during the year have been as follows: An extension of Gauley and Rich Creek Branch 0.1 mile; Dingess Run Branch of the Guyandot Valley line 0.8 mile; and an extension of Minden Branch up Rock Lick Creek 1.5 miles.

The Morris Creek Branch, 2.8 miles, extending from Morris Creek Junction to Morris Creek, W. Va., previously carried as side track mileage has been transferred to first track mileage.

The following lines have been taken over for operation during the year: Horse Creek Branch of Coal River line 2.5 miles; Peter Cave Fork Branch of Horse Creek Branch 2.0 miles; and Beech Creek Branch of Coal River line 1.6 miles.

First track mileage is increased 2.2 miles, due to Glade Creek and Raleigh Railroad being carried as 11.4 miles while the correct length is 13.6 miles.

The change of line at Walbridge, Ky., resulted in a decrease of 0.1 mile.

The following lines have been abandoned and taken up during the year: Sycamore Creek Extension of Cabin Creek Branch 0.5 mile; Old Main line of Raleigh and Southwestern Railway 0.3 mile; and the narrow gauge part of the Glade Creek and Raleigh Railroad 10.9 miles.

Second track between Balcony Falls and Greenlee, Va., 3.4 miles, has been completed.

There were 21,525.3 tons new rail (1,300.9 tons 125-lb., 17,774.2 tons 100-lb., and 2,450.2 tons 90-lb.) equal to 137 miles of track, used in renewal of existing track.

There were 1,587,350 cross ties used in maintaining existing tracks, a decrease of 328,612.

There were 1,004,954 yards of ballast (533,053 yards stone) used in maintaining existing tracks, an increase of 235,983 yards.

The average amount expended for repairs per locomotive was $3,299.51; per passenger train car $919.94; per freight train car $94.08.

Effective January 1, 1916, Mr. E. D. Hotchkiss was promoted from General Freight Agent to the position of Freight Traffic Manager; Mr. Thornton Lewis from General Western Freight Agent, to Assistant Freight Traffic Manager; and Mr. A. P. Gilbert from Assistant General Freight Agent to General Freight Agent.

Effective July 1, 1916, the following appointments were made: Mr. E. W. Grice, Assistant to President; Mr. J. P. Stevens, General Manager; Mr. E. P. Goodwin, General Inspector of Transportation and Station Service; Mr. W. L. Booth, Superintendent of Freight Transportation; Mr. L. B. Allen, General Superintendent, Central General Division; Mr. E. L. Bock, Superintendent, Huntington and Big Sandy Divisions; Mr. G. J. Derbyshire, Superintendent, C. & O. Ry. of Indiana.

Effective January 1, 1917, Mr. Meade T. Spicer was appointed Executive Assistant; Mr. George W. Poe, Auditor of Passenger Traffic was retired at his request, being succeeded by Mr. I. D. Briggs, Jr.

The Company lost three faithful officers during the year by death: Mr. L. L. Scherer, General Claim Agent, who died October 21, 1916; Mr. J. A. Fox, Superintendent Clifton Forge Division, who died October 25, 1916; Mr. G. S. Sipp, Car Service Agent, who died February 27, 1916. The vacancies caused were filled by the appointment of Mr. H. L. Dunham, General Claim Agent, in charge of personal injury claims; Mr. F. W. H. O'Meara, Freight Claim Agent, in charge of loss and damage claims; Mr. J. W. King, Chief Special Agent; Mr. J. A. Gleason, Superintendent, Clifton Forge Division, all effective November 1, 1916. The position of Car Service Agent was abolished and the department transferred to the Accounting Department.

The Board tenders its thanks to officers and employes for loyal and efficient services rendered during the year.

By order of the Board of Directors.

FRANK TRUMBULL, Chairman. GEO. W. STEVENS, President.

GENERAL INCOME ACCOUNT.

For Year ended December 31, 1916, and Comparison with Year ended December 31, 1915.

TABLE 2.

Operating Revenues:	1916.	1915.	Increase or Decrease.	Per Cent.
Freight Traffic	$39,888,932.23	$35,198,357.38	$ 4,690,574.85	13.3
Passenger Traffic	6,435,025.33	5,713,463.38	721,561.95	12.6
Transportation of Mails	472,981.62	443,004.34	29,977.28	6.8
Transportation of Express	669,029.39	594,987.81	74,041.58	12.4
Miscellaneous	2,368,343.61	1,631,027.97	737,315.64	45.2
Total Operating Revenues	$49,834,312.18	$43,580,840.88	$ 6,253,471.30	14.4
Operating Expenses:				
Maintenance of Way and Structures	$ 6,067,657.64	$ 5,112,084.09	$ 955,573.55	18.7
Maintenance of Equipment	10,240,497.62	8,980,824.84	1,259,672.78	14.0
Traffic	675,380.54	631,011.82	44,368.72	7.0
Transportation	14,355,564.64	13,197,859.88	1,157,704.76	8.8
Miscellaneous Operations	348,783.03	232,442.44	116,340.59	50.1
General	1,035,931.62	886,141.40	149,790.22	16.9
Transportation for Investment—Cr.	*25,139.24*	*41,738.75*	*—16,599.51*	*39.8*
Total Operating Expenses	$32,698,675.85 65.6%	$28,998,625.72 66.5%	$ 3,700,050.13	13.8
Net Operating Revenue	17,135,636.33	14,582,215.16	2,553,421.17	17.5
Railway Tax Accruals	1,636,604.01	1,445,684.96	190,919.05	13.2
Uncollectible Railway Revenues	12,355.33	16,172.04	—3,816.71	23.6
	$ 1,648,959.34	$ 1,461,857.00	$ 187,102.34	12.8
Railway Operating income	$15,486,676.99	$13,120,358.16	$ 2,366,318.83	18.0

GENERAL INCOME ACCOUNT (CONTINUED)

	1916.	1915.	Increase or Decrease.	Per Cent.
Income from Other Sources:				
Hire of Equipment	$ 535,912.32	$Dr. 74,980.10	$ 610,892.42	....
Interest from Investments and Accounts	761,430.65	561,897.88	199,532.77	35.5
Miscellaneous	343,800.01	347,075.17	—3,275.16	0.1
	$ 1,641,142.98	$ 833,992.95	$ 807,150.03	96.8
Gross Income	$17,127,819.97	$13,954,351.11	$ 3,173,468.86	22.7
Deductions from Gross Income:				
Interest on Debt	$ 8,382,833.09	$ 8,054,094.81	$ 328,738.28	4.1
Rentals Leased Roads, Joint Tracks, &c.	959,257.56	912,090.26	47,167.30	5.2
Loss on C. & O. Grain Elevator	54,060.88	Cr. 138,942.84	193,003.72	....
Miscellaneous	64,786.67	35,087.76	29,698.91	84.6
Total Deductions	$ 9,460,938.20	$ 8,862,329.99	$ 598,608.21	6.8
Net Income	$ 7,666,881.77	$ 5,092,021.12	$ 2,574,860.65	50.6

Amount to credit of Profit and Loss December 31, 1915		$ 6,679,169.91
Amount of Net Income for year ended December 31, 1916, transferred to Profit and Loss		7,666,881.77
		$14,346,051.68
Deduct:		
Dividend 33 of 2% Paid December 30, 1916		1,255,632.00
		$13,090,419.68
Discount and Expense on Securities issued during the year ended December 31, 1916	$ 2,529,145.51	
Premium on Five Year Secured Gold Notes called for payment, June 1, 1916	330,202.76	
Appropriation of Surplus to Sinking and Other Reserve Funds	57,000.00	
		2,916,348.27
		$10,174,071.41
Add Sundry adjustments		58,922.40
Balance to credit of Profit and Loss December 31, 1916		$10,232,993.81

GENERAL BALANCE SHEET DECEMBER 31, 1916.

ASSETS

(Excluding Stocks and Bonds owned of The C. & O. Ry. Co. of Indiana and of The C. & O. Equipment Corporation.)

TABLE 3.

Property Investment.		
Cost of Road		$174,421,169.47
Cost of Equipment		54,180,907.05
		$228,602,076.52
Improvements on Leased Railway Property		3,815.99
Securities of Proprietary, Affiliated and Controlled Companies—Pledged.		
Stocks—See Schedule, page 18	$13,613,999.44	
Bonds—See Schedule, page 18	4,110,407.01	
	$17,724,406.45	
Securities—Issued or Assumed—Pledged.		
Bonds—See Schedule, page 18 (Includes First Lien and Improvement Mortgage 5% Bonds $45,920,000.00. See Contra.)	45,920,001.00	
		$ 63,644,407.45
Miscellaneous Investments.		
Physical Property		341,005.63
Special Funds, and Funded Debt Issued and Reserved.		
First Lien and Improvement Mortgage Bonds—Drawn for Additions and Betterments	$ 1,345,000.00	
R. & S. W. Ry. Co., First Mortgage Bonds—Reserved for Construction	40,000.00	
Potts Creek Branch—Cash	45,676.24	
Special Deposits account of Construction and Equipment	1,920,873.88	
		$ 3,351,550.12
(Includes Cash and Note—Balance Proceeds K. & M. Ry. Co. Stock Sale.)		
		67,336,963.20
		$295,942,855.71
Working Assets.		
Cash in Treasury	$6,768,326.31	
Cash in Transit	1,507,466.08	$ 8,275,792.39
Cash deposits to pay Interest and Dividends		1,395,604.45
Cash deposit to pay Equipment Trust Principal		112,000.00
Cash deposits to pay Matured Bonds and Scrip		69,794.17
Cash deposit to pay C. & O. Grain Elevator Insurance Claims		3,792.97
Loans and Bills Receivable		224,403.05
Traffic Balances		1,011,483.68
Agents and Conductors		1,035,777.66
Miscellaneous Accounts Receivable		1,312,813.19
Other Working Assets		80,916.20
		$ 13,522,377.76
Materials and Supplies		4,200,015.46
Securities in Treasury—Unpledged.		
Stocks—See Schedule, page 17	$ 4,829,223.45	
Bonds—See Schedule, page 17	1,528,448.02	
		$ 6,357,671.47
Deferred Assets.		
Unmatured Interest, Dividends and Rents	$ 95,014.50	
Advances to Proprietary, Affiliated and Controlled Companies	226,768.39	
Advances, Working Funds (Fast Freight Lines, etc.)	37,522.45	
Special Deposits with Trustees, Various Mortgage Funds	86,386.03	
Cash and Securities in Sinking Funds	61,422.43	
Cash and Securities in Insurance Reserve Fund	66,244.22	
Sundry Accounts	422,710.64	
		$ 996,068.66
		25,076,133.35
Total		$321,018,989.06

LIABILITIES

(Excluding Stocks and Bonds owned of The C. & O. Ry. Co. of Indiana and of The C. & O. Equipment Corporation.)

Capital Stock.			
Common		$62,792,600.00	
First Preferred		3,000.00	
Second Preferred		200.00	
			$ 62,795,800.00
Common—The Chesapeake and Ohio Railway Co. of Indiana			1,200.00
			$ 62,797,000.00
Funded Debt.			
First Mortgage, Terminal, etc., 6% Bonds	1922	$ 142,000.00	
General Funding and Improvement, 5% Bonds	1929	3,698,000.00	
Convertible, 4½% Bonds	1930	31,390,000.00	
First Mortgage, R. & S. W. Railway, 4% Bonds	1936	857,000.00	
First Consolidated Mortgage, 5% Bonds	1939	29,858,000.00	
First Mortgage, Craig Valley Branch, 5% Bonds	1940	650,000.00	
First Mortgage, Greenbrier Railway, 4% Bonds	1940	1,762,000.00	
First Mortgage, Warm Springs Branch, 5% Bonds	1941	400,000.00	
First Mortgage, Big Sandy Railway, 4% Bonds	1944	4,563,000.00	
First Mortgage, Paint Creek Branch, 4% Bonds	1945	539,000.00	
First Mortgage, Coal River Railway, 4% Bonds	1945	2,776,000.00	
Convertible 5% Secured Gold Bonds	1946	40,180,000.00	
First Mortgage, Potts Creek Branch, 4% Bonds	1946	600,000.00	
First Mortgage, Va. Air Line Railway, 5% Bonds	1952	900,000.00	
First Mortgage, R. & A. Division, 4% Bonds	1989	6,000,000.00	
Second Mortgage, R. & A. Division, 4% Bonds	1989	1,000,000.00	
General Mortgage, 4½% Bonds	1992	48,129,000.00	
			$173,444,000.00
Equipment Trust Obligations and Contracts			6,846,386.89
			$180,290,386.89
			$243,087,386.89
First Lien and Improvement Mortgage, 5% Bonds not in hands of public (see Contra)	1930		47,265,000.00
Working Liabilities.			
Loans and Bills Payable		$ 95,000.00	
Traffic Balances		508,457.80	
Audited Vouchers and Pay Rolls		5,006,513.32	
Unpaid Wages		27,313.39	
Miscellaneous Accounts Payable		395,163.42	
Matured Interest and Dividends Unpaid		1,503,121.14	
Matured Mortgage and Secured Debt Unpaid		69,794.17	
Other Working Liabilities		95,888.07	
			$ 7,701,251.31
Deferred Liabilities.			
Unmatured Interest and Rents		$ 2,365,166.45	
Taxes Accrued		930,339.30	
Accrued Depreciation—Equipment		5,846,710.51	
Sundry Accounts		505,423.95	
			9,647,640.21
			$ 17,348,891.52
Appropriated Surplus.			
Additions to Property through Income since June 30, 1907		$ 2,984,365.23	
Reserve Invested in Sinking Funds		34,107.39	
Reserve Invested in Insurance Fund		66,244.22	
			$ 3,084,716.84
Profit and Loss—Balance			10,232,993.81
			$ 13,317,710.65
Total			$321,018,989.06

Railway Officers

Executive, Financial, Legal and Accounting

C. E. Burr, general superintendent of transportation of the Delaware & Hudson, has been appointed vice-president of the Greenwich & Johnsonville, with headquarters at Greenwich, N. Y.

W. Mosby has been appointed transportation assistant to the first vice-president of the St. Louis Southwestern and to the president of the St. Louis Southwestern of Texas, with headquarters at St. Louis, Mo.

Benjamin F. Bush, receiver of the Missouri Pacific-St. Louis, Iron Mountain & Southern has been elected president of the new Missouri Pacific Railway Company, which in a few weeks will take over the lines of the combined system. F. J. Shepard, assistant to the receiver with headquarters at New York, was elected vice-president in the same city. A. Robertson, chief operating officer was elected vice-president in charge of operation and construction, J. G. Drew, chief accounting officer was elected vice-president in charge of accounts, Edward J. White, general counsel for receiver was elected vice-president and genral solicitor and H. M. Adams, general traffic manager was elected vice-president in charge of traffic. All the headquarters are in St. Louis.

Clive Runnells, assistant to the president of the Pullman Company, with headquarters at Chicago, Ill., has also been elected vice president. He was born at Des Moines, Ia., September 10, 1877. After a preliminary education at private schools he entered Harvard University, leaving this institution in 1900, to take employment in the traffic department of the Chicago Junction at Chicago in the latter part of 1900. He left the service of that road four years later and then for six months was commercial agent of the Pere Marquette at Chicago. On January 1, 1905, he went to the Western Steel Car & Foundry Company as manager of sales. Subsequently he became connected with McCord & Co., Chicago, of which concern he was elected vice-president. For a time he was associated with the American Car & Foundry Company, resigning to become a member of the firm of Babcock, Rushton Company, stock and bond brokers, Chicago. On April 1, 1915, he was elected assistant to the president of the Pullman Company, which latter position he will continue to hold in addition to becoming vice-president.

C. Runnells

James D. Watson, assistant general freight agent of the St. Louis Southwestern, has been appointed assistant to the first vice-president of that road and assistant to the president of the St. Louis Southwestern of Texas, with headquarters at St. Louis, Mo., succeeding Fred W. Green, who has been granted an indefinite leave of absence to serve in the U. S. Army. Mr. Watson was born at Port Huron, Mich., on June 30, 1870. He began railway work in August, 1883, as shop timekeeper in the machinery and car department of the St. Louis, Iron Mountain & Southern at Baring Cross, Ark., and was employed in various clerical capacities in the mechanical, car and store departments until August, 1888, when he was made general storekeeper of the St. Louis, Arkansas & Texas (now the St. Louis Southwestern) at Pine Bluff, Ark. In October of that year he returned to the St. Louis, Iron Mountain & Southern at Little Rock and served in the transportation and traffic departments until October, 1895. Mr. Watson was then employed in the division freight office of the St. Louis Southwestern at Little Rock, remaining in the traffic department until November, 1913, and serving consecutively as soliciting agent, traveling freight agent, division freight agent and assistant general freight agent. From November, 1913, to May, 1914, he was vice-chairman of the Southwestern Tariff Committee at St. Louis, and on the latter date re-entered the service of the St. Louis Southwestern as assistant freight traffic manager. With the reorganization of the freight traffic department in November, 1915, his title was changed to assistant general freight agent, which position he held until his recent appointment, as noted above.

Operating

Frederick F. Backus, assistant to president of the Toronto, Hamilton & Buffalo, has been appointed general manager, with headquarters at Hamilton, Ont., and the position of assistant to president is abolished.

H. F. Burch having resigned, the position of general superintendent of the Greenwich & Johnsonville has been abolished, and F. J. Scully has been appointed superintendent in charge of operating and traffic departments with office at Greenwich, N. Y.

J. B. Dickson has been appointed general superintendent of transportation of the Delaware & Hudson with office at Albany, N. Y., vice C. E. Burr resigned, and H. F. Burch, general superintendent of the Greenwich & Johnsonville, has been appointed assistant to general manager of the Delaware & Hudson with office at Albany.

W. G. Curren, assistant general superintendent of transportation of the Baltimore & Ohio, at Cincinnati, Ohio, has been appointed superintendent of transportation, with headquarters at Baltimore, Md., and his former position has been abolished; E. W. Hoffman, assistant superintendent of the Toledo division, has been promoted to assistant superintendent of transportation, with office at Cincinnati, effective June 1.

M. H. Broughton, superintendent of the Illinois division of the Baltimore & Ohio at Flora, Ill., has been appointed superintendent of the Connellsville division with office at Connellsville, Pa., succeeding O. L. Eaton, who is serving at the Officers' Reserve training camp, Fort Myers, Va.; Ross Mann, superintendent of the Delphos division, has been appointed superintendent of the Illinois division, and E. J. Carrell, district engineer of maintenance of way of the Southwest district, has been appointed superintendent of the Delphos division.

F. M. Smith, general superintendent of the third district of the New York Central lines west, at Cleveland, Ohio, has been appointed superintendent of passenger transportation vice S. T. Gage, retired. F. H. Wilson, general superintendent of the fourth district at Chicago, succeeds Mr. Smith; W. F. Schaff, superintendent of the Toledo division at Cleveland, succeeds Mr. Wilson; E. R. Bissell, superintendent of the Western division at Chicago, succeeds Mr. Schaff; F. W. Watkins, superintendent of the Alliance division at Alliance, Ohio, succeeds Mr. Bissell, and D. J. Evans, assistant superintendent of the Toledo division at Cleveland, succeeds Mr. Watkins. Effective May 19.

James Lee Hayes, who was appointed general superintendent of the Pere Marquette, with headquarters at Detroit, Mich., has already been announced in these columns, was born at Holly, Mich., on April 25, 1866. He entered railway service in March, 1882, as a brakeman on the Pere Marquette, and was promoted to freight conductor in December, 1885. In November, 1893, he was appointed yardmaster for the Pennsylvania, with office at Toledo, Ohio, and returned to the Pere Marquette in November, 1898, as general yardmaster, with the same headquarters. On February 1, 1904, he was appointed trainmaster of the Toledo division, and on November 1, 1912, was promoted to division superintendent, with headquarters at Grand Rapids, Mich., which position he continued to hold up to the time of his appointment, noted above.

John J. Mantell, whose appointment as general superintendent of the Erie, lines east, with headquarters at New York has already been announced in these columns, was born at Elmira, N. Y., and was educated in the public schools and Elmira Academy. He entered the service of the Erie in June, 1899, as clerk and stenographer in superintendent's office, and later served consecutively as yard clerk, chief yard clerk, yardmaster and general yardmaster at Croxton and Jersey City, N. J., and Susquehanna,

Pa. He was then special agent in the office of the general superintendent at New York and later served consecutively as trainmaster on the Delaware and Jefferson divisions, terminal trainmaster at Jersey City, and superintendent of the Wyoming division. In December, 1915, he was appointed superintendent of terminals at Jersey City, which position he held at the time of his recent appointment as general superintendent of the lines east of the same road.

Howard Scott, who has been appointed superintendent of the Ontario division of the New York Central, with headquarters at Oswego, N. Y., as has already been announced in these columns, was born on August 30, 1872, at Thurmont, Md., and graduated from the high school at Philipsburg, Pa., in 1887. He began railway work on November 26, 1888, with the New York Central, as night telegraph operator at Hawk Run yard on the Pennsylvania division. In September, 1893, he was promoted to train despatcher, and in January, 1905, he was made assistant trainmaster. On November 1, 1907, he was promoted to trainmaster, and in May, 1912, he was appointed assistant superintendent, which position he held at the time of his appointment as superintendent on the same road, as above noted.

H. Scott

H. C. Oviatt, who has been appointed general superintendent of the New York, New Haven & Hartford, lines west, with headquarters at New Haven, Conn., was born on December 5, 1871, at Milford, Conn. He graduated from the high school at Milford and began railway work in May, 1889, as a locomotive fireman on the New York, New Haven & Hartford. In July, 1894, he was promoted to locomotive engineer, and in February, 1900, was appointed air brake inspector. Three years later he was appointed foreman of engines, and in August, 1904, was promoted to master mechanic on the same road. He subsequently served as general inspector of the mechanical department, and in May, 1913, was appointed assistant mechanical superintendent. The following September he was appointed superintendent of the Old Colony division, and on November 9, 1914, was selected to organize and supervise the bureau of fuel economy on the same road, with the title of assistant mechanical superintendent. He subsequently served as superintendent first of the Shore Line division and later of the New Haven division of the same road.

H. C. Oviatt

P. G. Campbell, trainmaster of the Chicago & North Western at Boone, Ia., has been promoted to assistant superintendent at Clinton, Ia., succeeding G. A. Holmes, who has been assigned to duty as captain of the Chicago & North Western railway regiment. A. L. Clapp, roadmaster at Chicago, has been promoted to trainmaster, Chicago, succeeding E. H. Shaughnessey who has been assigned to duty as first lieutenant of the North Western railway regiment. C. Witteried, trainmaster at Sterling, Ill., has been transferred to West Chicago, Ill., F. R. Lloyd, trainmaster at Benld, Ill., has been transferred to Sterling, succeeding Mr. Witteried. P. R. Kulp, division engineer at Antigo, Wis., has been appointed trainmaster at Benld, Ill., succeeding Mr. Lloyd. R. A. Hall, trainmaster at Adams, Wis., has been transferred to Proviso, Ill., succeeding E. E. Cunningham. J. I. DeSautelle has been appointed trainmaster at Adams, Wis., succeeding R. J. Hall. C. H. Bowen, trainmaster at West Chicago, Ill., has been transferred to Belle Plaine, Ia., succeeding J. S. Rice, appointed trainmaster of military service with headquarters at Des Moines, Ia. W. H. Noyes, inspector on the staff of the general superintendent has been appointed trainmaster at Boone, Ia., succeeding Mr. Campbell, promoted.

Ritchie Graham Kenly, chief engineer of the Minneapolis & St. Louis, with office at Minneapolis, Minn., has been appointed general manager, succeeding James Russell, resigned. He was born at Ritchie Mines, W. Va., on March 13, 1866, and was educated at Baltimore City College, Baltimore, Md. He entered railway service in September, 1885 as a rodman on the Annapolis & Baltimore Short Line, being later promoted to levelman on location and surveys. After a short service as levelman for the Baltimore & Eastern in 1886, he was appointed transitman on hydrographic surveys on improvements then being made in Baltimore harbor. From October, 1886, to March, 1891, he was assistant supervisor of the Northern Central, and from March, 1891, to July, 1893, he was supervisor of the Radford division of the Norfolk & Western. In July, 1893, he was promoted to assistant engineer of the same road, and in April, 1897, he was advanced to assistant trainmaster. From February, 1898, to April, 1899, he was assistant to the chief engineer of the West Virginia Central & Pittsburgh, and from May, 1899, to May, 1900, he was construction engineer for the Philadelphia & Erie and the Northern Central. In July, 1900, he was appointed division engineer of the Lehigh and New Jersey divisions of the Lehigh Valley, and in November, 1904, was made trainmaster of the same divisions, with office at Easton, Pa. He was appointed general superintendent of the Lehigh & New England in March, 1907, and in June, 1908, became engineer maintenance of way of the Lehigh Valley. In March, 1909, he was appointed chief engineer of the Minneapolis & St. Louis.

R. G. Kenly

Under the divisional organization of the New York, New Haven & Hartford, described elsewhere in this issue, C. L. Bardo, general manager; Edward Gagel, chief engineer; George G. Yeomans, general purchasing agent; and G. W. Hayden, general storekeeper, will report to the president; John A. Droege, Clayton N. Woodward and H. C. Oviatt, general superintendents; George W. Wildin, general mechanical superintendent; Charles H. Morrison, signal engineer; J. O. Halliday, superintendent of transportation; N. E. Smith, superintendent of telegraph; and William J. Backes, engineer of maintenance of way, will report direct to general manager Bardo. Clayton N. Woodward, general superintendent of lines east, is assisted by R. D. Fitzmaurice, assistant general superintendent; George A. Moriarty, mechanical superintendent; and W. D. Warren, engineer of lines. H. C. Oviatt, general superintendent of lines west, with office at New Haven (hitherto division superintendent at New Haven), is assisted by Charles J. Stewart, mechanical superintendent; and Paul Sterling, engineer of lines. John A. Droege, general superintendent of the New York division, Terminals and Connecting Railway, will have his office at the Grand Central Terminal, New York. He is assisted by A. L. Ralston, engineer of electric traction; H. G. Gilliam, superintendent of electric transmission; R. S. Clark, master of lighterage, and C. F. Yardly, maintenance en-

gineer. Messrs. Clark and Yardly have their offices at Harlem River, N. Y. The connecting railway is the line over the Hell Gate bridge, connecting with the Long Island and the Pennsylvania railroads. The superintendents are: Charles H. Motsett, New York division; M. D. Miller, Highland division; William H. Foster, New Haven division; Carl A. Mitchell, Hartford division; Edward E. Regan, New London division; George A. Poore, Providence division; William T. Spencer, Old Colony division; F. S. Hobbs, Boston division; and Harry Astley, Midland division. James McDowell, heretofore agent at Harlem River, New York, is now supervisor of station service.

Traffic

George D. Hunter, general passenger agent of the Texas & Pacific, has been appointed passenger traffic manager, with headquarters at Dallas, Tex. Effective May 15.

L. C. Zimmerman has been appointed general agent of the Southern Pacific at Denver, Colo., succeeding H. F. Kern, who has been transferred to Detroit, Mich., in place of E. A. Macon, resigned.

William D. McVey, state agent of the Ontario Central Despatch and commercial agent of the Rutland-Michigan Central Lines at Toledo, Ohio, has also been appointed commercial agent of the Michigan Central at Toledo.

George H. Westcott, whose appointment as general freight and passenger agent of the Copper Range at Houghton, Mich., was announced in these columns several weeks ago, entered railway service in 1891, as a call boy on the Chicago, St. Paul, Minneapolis & Omaha. He was soon promoted to telegraph operator and agent, and served in that capacity at various stations along the line until 1896, when he was appointed contracting agent for the Duluth Railroad at Duluth, Minn. He was connected with that company until it was taken over by the Northern Pacific in 1900, when he was appointed train despatcher at Duluth. Later he was made contracting agent for the Chicago, Milwaukee & St. Paul at Duluth, and was then advanced to traveling freight agent. In 1910, he was appointed commercial agent for the same company at Buffalo, N. Y., and in the following year was made division freight agent at Chicago, Ill., which position he resigned to become general freight and passenger agent of the Copper Range, as noted above.

G. H. Westcott

C. R. Gilfillan, live stock agent of the Atchison, Topeka & Santa Fe at Wichita, Kan., has been appointed assistant general live stock agent, with headquarters at Kansas City, Mo., succeeding R. S. Van Slyck, deceased.

A. D. Bell, assistant general passenger agent of the Texas & Pacific at Dallas, Tex., has been appointed general passenger agent, and Frank Jensen, who was chief clerk to the general passenger agent, has been appointed assistant general passenger agent.

H. T. Yeaton, commercial agent of the Cleveland, Cincinnati, Chicago & St. Louis at Minneapolis, Minn., has been transferred to Kansas City, Mo., succeeding N. R. Markle, resigned to enter army service. E. F. Mueller has been appointed commercial agent at Minneapolis, succeeding H. T. Yeaton, transferred.

J. O. Hamilton, general agent of the Kansas City Southern at Chicago, has been appointed assistant general freight agent of that company and, in addition, general freight agent of the Texarkana & Ft. Smith, with headquarters at Texarkana, Tex. He will be succeeded as general agent at Chicago by Henry Brown, traveling freight agent.

Henry Dupre Landry, whose appointment as assistant general freight agent of the St. Louis Southwestern, with office at St. Louis, Mo., was noted in these columns last week, was born at St. Louis, on March 8, 1868. He entered railway service on June 1, 1883, as a messenger with the Wiggins Ferry Company and a year later was promoted to yard clerk. On May 1, 1886, he was appointed collector for the St. Louis, Alton & Terre Haute at East St. Louis, Ill., later being promoted to assistant cashier, inbound and outbound bill clerk and chief clerk. For a short time he was chief clerk to the commercial agent for the St. Louis Southwestern at St. Louis, and was then appointed contracting agent and traveling freight agent in turn. In January, 1903, he was promoted to commercial agent, with office at Cincinnati, Ohio, and in December, 1908, was transferred with the same title to St. Louis, Mo., which position he held at the time his appointment, as noted above, became effective.

Mortimer L. Harris, whose appointment as general passenger agent of the Maine Central, with headquarters at Portland, Me., has already been announced in these columns, was born on January 5, 1873, at Wakefield, Mass., and was educated in the common schools. He began railway work in May, 1889, with the Boston & Maine and served in the passenger department of that road until January, 1907. The following month he went to the passenger department of the Consolidated Steamship Lines, and in November of the same year entered the service of the New York Central in the passenger department. From September, 1908, to January, 1911, he served in the passenger department of the New York, New Haven & Hartford, and from February, 1911, to May, 1913, was secretary-treasurer of the New England Passenger Association. In June, 1913, he was appointed assistant to general passenger agent of the Maine Central, remaining in that position until September, 1915, when he was appointed assistant general passenger agent, which position he held at the time of his recent appointment as general passenger agent of the same road, as above noted.

Engineering and Rolling Stock

S. W. Caton, general car inspector of the Western Maryland at Hagerstown, Md., has been promoted to master car builder with headquarters at Hagerstown.

W. W. Kelly has been appointed division engineer on the Albuquerque division, Atchison, Topeka & Santa Fe, succeeding M. C. Bryan, transferred, effective May 12.

H. A. Lyddon has been appointed superintendent of shops of the Northern Pacific, with office at South Tacoma, Wash., succeeding F. W. Malott, retired from active service.

A. A. Matthews, engineer maintenance of way of the Missouri, Kansas & Texas, lines south, at Dallas, Tex., has been appointed engineer maintenance of way, lines north, with headquarters at Parsons, Kans.

C. A. Lyon, formerly signal inspector and estimator of the Illinois Central, at Chicago, has been appointed general signal inspector of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., vice H. B. Pflasterer, resigned to go into other business.

F. L. Beal, whose appointment as chief engineer of the Louisiana & Arkansas was announced in these columns two weeks ago, was born at Salem, Ind., August 22, 1886. He received his education at Purdue University, Lafayette, Ind., graduating from the civil engineering department in 1908. In July, 1908, he entered railway service with the Cleveland, Cincinnati, Chicago & St. Louis as an instrument man, and in August, 1909, was employed by the Louisiana & Arkansas as a transit man, since which time he has been consecutively assistant engineer maintenance of way, resident engineer, chief clerk to the general superintendent, chief clerk to the general manager, valuation engineer, statistician in charge of rate cases and superintendent. Mr. Beal was superintendent at the time of his appointment as chief engineer. He succeeded W. H. Vance, resigned to go with another company.

Purchasing

William Davidson, whose appointment as general storekeeper of the Illinois Central, with office at Burnside (Chicago), was noted in these columns three weeks ago, was born at Selma, Ala. After leaving school he served an apprenticeship in steam and gas fitting, and for two years was employed by the United Gas & Improvement Company, Vicksburg, Miss. In 1893, he entered railway service with the Yazoo & Mississippi Valley at Vicksburg as a car repairer, later serving consecutively as master car builder and wheel clerk, stockkeeper, file clerk, assistant timekeeper, general timekeeper, accountant, storekeeper and assistant chief clerk to the master mechanic. In June, 1908, he was appointed division storekeeper at Vicksburg, and in May, 1910, was promoted to assistant general storekeeper of the Illinois Central and the Yazoo & Mississippi Valley at Burnside (Chicago).

W. Davidson

Ernest Baxter, whose appointment as general storekeeper of the Wabash, with office at St. Louis, Mo., has already been announced in these columns, was born at Delmer, Ont., on October 11, 1882. He began railway work with the Michigan Central in March, 1903, as a messenger in the local freight office, and in May, 1903, was employed by the Algoma Central & Hudson Bay at Sault Ste. Marie, Ont., in a similar capacity. In October, 1903, he was appointed secretary to the superintendent of the Grand Trunk at London, Ont., and in April, 1905, entered the operating department of the Cincinnati, Hamilton & Dayton at Indianapolis, Ind., and later that of the Missouri Pacific at St. Louis, Mo. He was appointed secretary to the general manager of the St. Louis Southwestern at St. Louis in February, 1906, and in May, 1909, was promoted to chief clerk to the president. From June, 1914, to February, 1916, he was purchasing agent of this same company, and from March 1, 1917, to April 30, 1917, was a service inspector for the Wabash at St. Louis, which position he held at the time of his appointment, noted above.

E. Baxter

Thomas H. Ryan, whose appointment as purchasing agent of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific, with office at New Orleans, La., has already been announced in these columns, was born at New Orleans, on March 31, 1886. He entered railway service on July 7, 1903, as a stenographer in the general passenger department of the New Orleans & Northeastern, the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific. From December, 1905, to April, 1909, he was traveling secretary to the president and general manager of these three companies, and from April, 1909, to May, 1917, he was chief clerk in the purchasing department, which position he continued to fill up to the time of his appointment, as noted above. He succeeds W. J. Kelliher, resigned to enter other business.

Railway Officers in Military Service

J. S. Rice, trainmaster of the Chicago & North Western at Belle Plaine, Ia., has been appointed trainmaster of military affairs, with headquarters at Des Moines, Ia.

W. F. Dwyer, traveling auditor of the Arizona Eastern at Tucson, Ariz., left railway service on May 9, to enter a training camp for the Line Officers' Reserve Corps, at the Presidio, San Francisco, Cal.

H. B. Stratton, assistant general advertising agent of the Illinois Central, has resigned to become a member of the Northwestern University hospital unit, No. 12, which expects to see early service in France.

R. W. LeBaron, examiner of joint facilities, Chicago Great Western, at Chicago, Ill., has been appointed second lieutenant, Engineer Officers' Reserve Corps, and is now on active duty with the Third Reserve Engineers.

O. L. Eaton, superintendent of the Connellsville division of the Baltimore & Ohio at Connellsville, Pa., has been relieved of his duties to become transportation expert at the Officers' Reserve training camp, Fort Myer, Va., representing the Baltimore & Ohio.

F. W. Green, assistant to the first vice-president of the St. Louis Southwestern, with headquarters at St. Louis, Mo., was called to service at Fort Riley, Kans., on May 8. Mr. Green has received a commission as captain of engineers, Officers' Reserve Corps.

William A. Garrett, assistant general manager of the Remington Arms Company, Eddystone, Pa., and formerly vice-president of the Chicago Great Western, has been commissioned major in the Engineers' Officers' Reserve Corps and has been assigned to active duty.

F. G. Pettibone, vice-president and general manager of the Gulf, Colorado & Santa Fe, with headquarters at Galveston, Tex., has been appointed by the governor of Texas as a member of the State Council of Defense. He is the only transportation man in the council.

Robert M. Miller, pilot engineer of the valuation department of the Virginian Railway, has left the service of that company to attend the engineer officers reserve training camp at Fort Benjamin Harrison, Indianapolis, Ind. M. L. Davis, resident engineer, has reported at the engineer officers' reserve training camp at Fort McPherson, Ga.

Jenks B. Jenkins, valuation engineer of the Baltimore & Ohio, has received a commission as major in the engineering division of the United States Army. Nineteen assistant engineers and other employees of the valuation department of the railroad have applied for commissions in the engineering branch of the service or have enlisted in the army and navy since the call for troops was made.

W. J. Leahy, general passenger agent of the Chicago, Rock Island & Pacific, Chicago, who received a commission as major in the quartermaster's department, United States Army, some time ago, was called into active service, with headquarters at the federal building, Chicago, on May 15. All business in the general passenger office of the Rock Island will continue to be conducted under Mr. Leahy's name.

Officers of the Central of Georgia have entered and are now engaged in military service as follows: R. H. Woods, personal secretary to Alexander R. Lawton, vice-president, has gone to the officers' reserve training camp at McPherson, Ga.; A. L. Lawton, Jr., of Lawton & Cunningham, general counsel, is a lieutenant colonel in the First Infantry of the Georgia National Guard which returned from the Mexican border in March, and R. E. Steiner, of Steiner, Crum & Weil, the company's chief counsel in Alabama, served at the border as colonel of the First Cavalry, Alabama National Guard and now holds a commission as brigadier general in the Alabama National Guard.

ITALIAN AIR POST ON FIRST TRIP.—An air postal service was inaugurated on May 22, between Turin and Rome. An aeroplane left Turin at 11:15 a. m. with 400 pounds of letters, 200 pounds of newspapers, and arrived at Rome at 3:30 p. m.